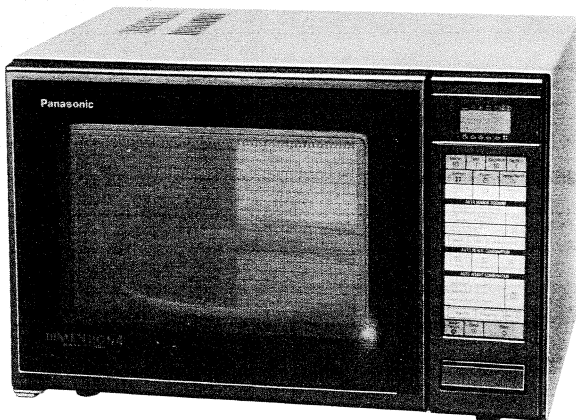


Service Manual

Microwave Oven

NN-8507, NN-8557 NN-8807, NN-8857

For United Kingdom
For NAAFI



NN-8807



NN-8507

Specifications

Power Source :	240 V AC Single Phase 50 Hz
Power Requirement :	1,400 W (6.0 A).....Microwave 1,740 W (7.3 A).....Bake  1,740 W (7.3 A).....Grill 
Output :	700 W.....Full Microwave Power 1,700 W.....Heater
Microwave Frequency :	2,450 MHz
Timer :	99 Min. 99 Sec./9 Hr. 99 Min.
Outside Dimensions :	550 mm (W) × 430 mm (D) × 363 mm (H)
Oven Cavity Dimensions :	350 mm (W) × 356 mm (D) × 202 mm (H)
Weight :	27 kg
Specifications subject to change without notice.	

Panasonic

Matsushita Electric Industrial Co., Ltd.

Central P.O. Box 288, Osaka 530-91, Japan

WARNING

- * This product including the oven lamp should be serviced only by trained, qualified personnel.
- * This service manual covers products for following markets.
When troubleshooting or replacing parts, please refer to the country identifications shown below for your applicable product specification.
BPQ.....For United Kingdom
PPQ.....For NAAFI

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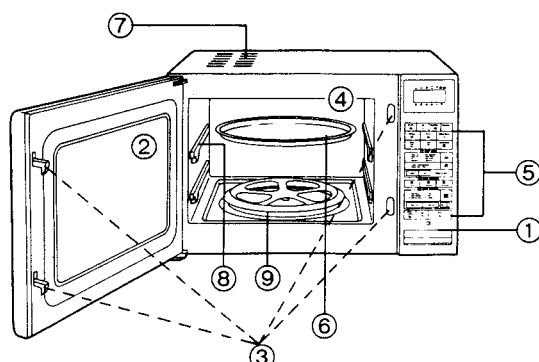
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FEATURE CHART

FEATURE	MODEL	NN-8507	NN-8807
		NN-8557	NN-8857
CYCLIC DEFROST		○	○
THREE STAGE COOKING		○	○
AUTO SENSOR COOKING		—	○
AUTO REHEAT COMBINATION COOKING		○	○
AUTO WEIGHT COMBINATION COOKING		○	○
COMBINATION — TIME COOKING		○	○
BAKING — AUTO PREHEATING		○	○
BAKING — TIME COOKING		○	○
GRILL — AUTO PREHEATING		○	○
GRILL — TIME COOKING		○	○
DELAY/STAND		○	○
DIGITAL CLOCK		○	○

FEATURE DIAGRAM & CONTROL PANEL

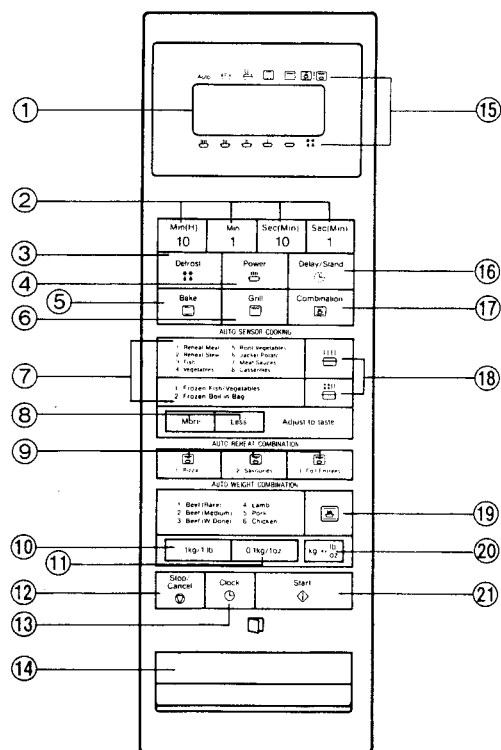
Feature Diagram



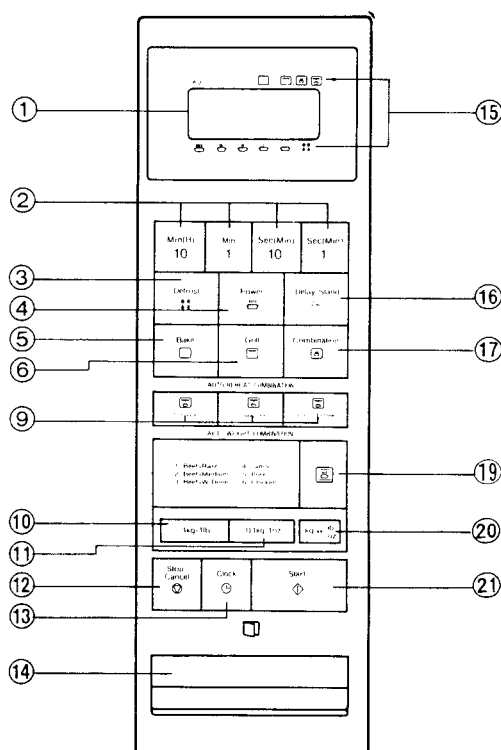
- ① Door Release Button
- ② Oven Window
- ③ Door Safety Lock System
- ④ Oven Air Vents
- ⑤ Control Panel
- ⑥ Glass Ceramic Tray
- ⑦ External Oven Air Vents
- ⑧ Slide in Shelf Guides
- ⑨ Metal Turn Table

Control Panel

NN-8807/NN-8857



NN-8507/NN-8557



Controls with Auto Count-Up Feature*

- ① Display Window
- ② Time Pads*
- ③ Defrost Pad
- ④ Power Pad*
- ⑤ Bake Pad*
- ⑥ Grill Pad*
- ⑦ Auto Sensor Cooking Guide
- ⑧ Adjust to Taste Pad
More Pad
Less Pad
- ⑨ Auto Reheat Combination Pad*
- ⑩ 1 kg/1 lb Pad*
- ⑪ 0.1 kg/1 oz Pad*
- ⑫ Stop/Cancel Pad
- ⑬ Clock Pad
- ⑭ Door Release Button
- ⑮ Indicator Lights
- ⑯ Delay/Stand Pad
- ⑰ Combination Pad*
- ⑱ Auto Sensor Cooking Pad*
- ⑲ Auto Weight Combination Pad*
- ⑳ kg/lb Convert Pad
- ㉑ Start Pad

OPERATION PROCEDURE

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
CLOCK SET		Enter Time of Day 10 1 10 1			
MICROWAVE COOKING (TWO STAGE)		Set Time 10 1 10 1		Set Time 10 1 10 1	Start
CYCLIC DEFROST		Set Time 10 1 10 1	Start 		
AUTO SENSOR COOKING	or A1~A8 F1~F2	If desired More Less or	Start 		
AUTO REHEAT COMBINATION		Start 			
AUTO WEIGHT COMBINATION COOKING		Set Weight kg lb oz 1kg /1lb 0.1kg /1oz	Start 		
COMBINATION-TIME COOKING	Combination 	Set Time 10 1 10 1	Start 		
BAKING WITHOUT PREHEAT	Bake 	Set Time 10 1 10 1	Start 		
BAKING WITH PREHEAT	Bake 	Start 	(Preheating)	Set Time 10 1 10 1	Start
GRILL WITHOUT PREHEAT	Grill 	Set Time 10 1 10 1	Start 		
GRILL WITH PREHEAT	Grill 	Start 	(Preheating)	Set Time 10 1 10 1	Start

For more detailed operating sequence, See page 29 through 31.

NOTES WHEN PROGRAMMING:

1. CLOCK SET:

- (1) To reset time of day touch CLOCK Pad twice within two seconds to clear the time. Colon will begin to blink. Enter the correct time of day.
- (2) The clock will keep the time of day as long as oven is plugged in and electricity is supplied.

2. AUTO SENSOR COOKING:

- (1) The Auto Sensor system works by detecting a build-up of steam on the humidity sensor. As foods cook in a microwave oven, steam is produced. When foods are covered, the steam will build up and escape from the dish in a burst. This burst of steam is detected by the humidity sensor and then the oven automatically calculates the remaining cooking time.
- (2) When an Auto Sensor Category is selected, A1 to A8 (F1 to F2) will appear in the display window. The oven door should not be opened for longer than one minute when A1 through A8 appears in the display window. Opening the door may cause inaccurate cooking results. Once the steam is detected, a two beep signal is heard, and the remaining cooking time immediately appears in the display window and begins to count-down. At this time, the oven door may be opened to stir, turn or add foods.
- (3) The room air temperature surrounding the oven should not be above 35°C when using Auto Sensor Cooking feature. Inaccurate cooking may result.
- (4) Foods less than 100g (4 oz) should be cooked by power and time, not by the Auto Sensor Cooking Cycle.

- (5) If Auto Sensor Cooking is programmed a short time after Bake, Grill or Combination Cooking "H" will appear in display window and blink. The HOT sign indicates that the oven cavity is too hot for the proper operation of the Auto Sensor Function. While the HOT sign is in display window, the unit cannot be operated by Auto Sensor. If START is pressed, room temperature air is circulated in the oven cavity to cool it. You may leave the door ajar to cool the unit. After the unit is cooled, the oven beeps 5 times and time of day appears in display window. Auto Sensor cycles can now be programmed. The oven cool with a self-contained cooling fan by touching START Pad on "H" indicated condition.

3. BAKING - AUTO PREHEATING

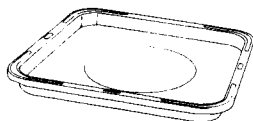
- (1) Preheat Oven without the glass ceramic tray in place. Unless otherwise stated, preheat with Slide in Shelf in lower position.
- (2) After preheating, open oven door and place food inside oven. If oven door is not opened after preheating, oven will maintain the selected temperature for 30 minutes. After 30 minutes, oven will shut off automatically and revert to time.

4. GRILLING - AUTO PREHEATING

- (1) Oven should be preheated without the glass ceramic tray in place. Unless otherwise stated, preheat with Slide in Shelf upper position.
- (2) If oven door is not opened after preheating, oven will maintain the selected temperature for approx. 30 minutes. After that, oven will shut off automatically.
- (3) After preheating, open oven door and place food (on Splash Guard) on to Slide in Shelf.

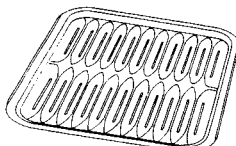
ACCESSORIES

Accessories and Use



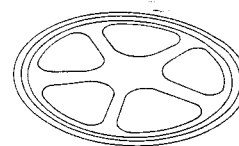
Slide-in Shelf
(A060W4210AP)

Do not use the Slide-in Shelf for Microwave or Combination.



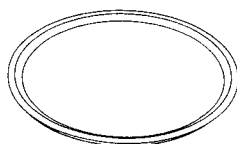
Splash Guard
(A06484210AP)

Use with the Slide-in Shelf. Splash Guard helps prevent splattering. Only use the Splash Guard for Grilling.



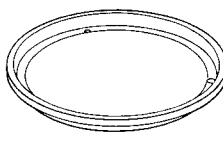
Metal Turn Table
(A201F4210AP)

The metal Turn Table should always be used in the oven. It should never be removed, when oven is in operation.



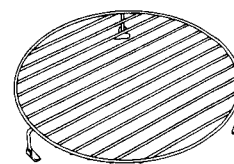
Glass Ceramic Tray
(ANE0601-Y30)

The glass ceramic tray is **removed** for GRILL or BAKE.



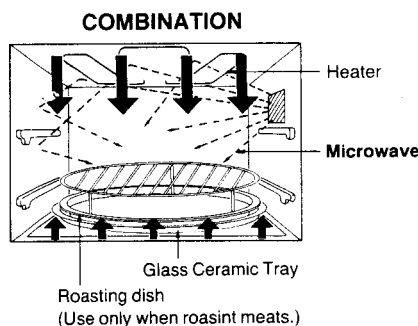
Roasting Dish
(A06034210BP)

Use the Roasting Dish for Combination.

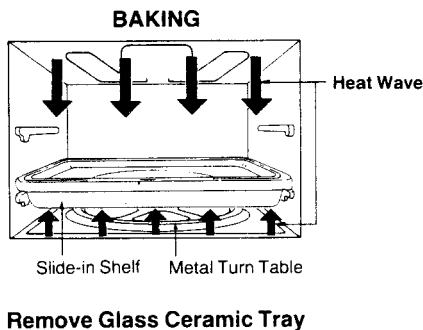
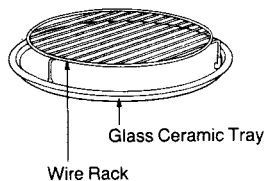


Wire Rack
(ANE0602Z70BP)

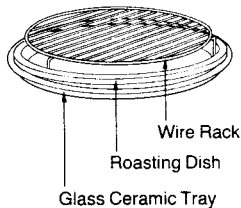
Use with the Roasting Dish for roasting. Use the Wire Rack for Pre-set Combination.



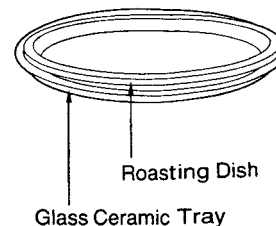
**For Combination Cooking
(not Roasting)**



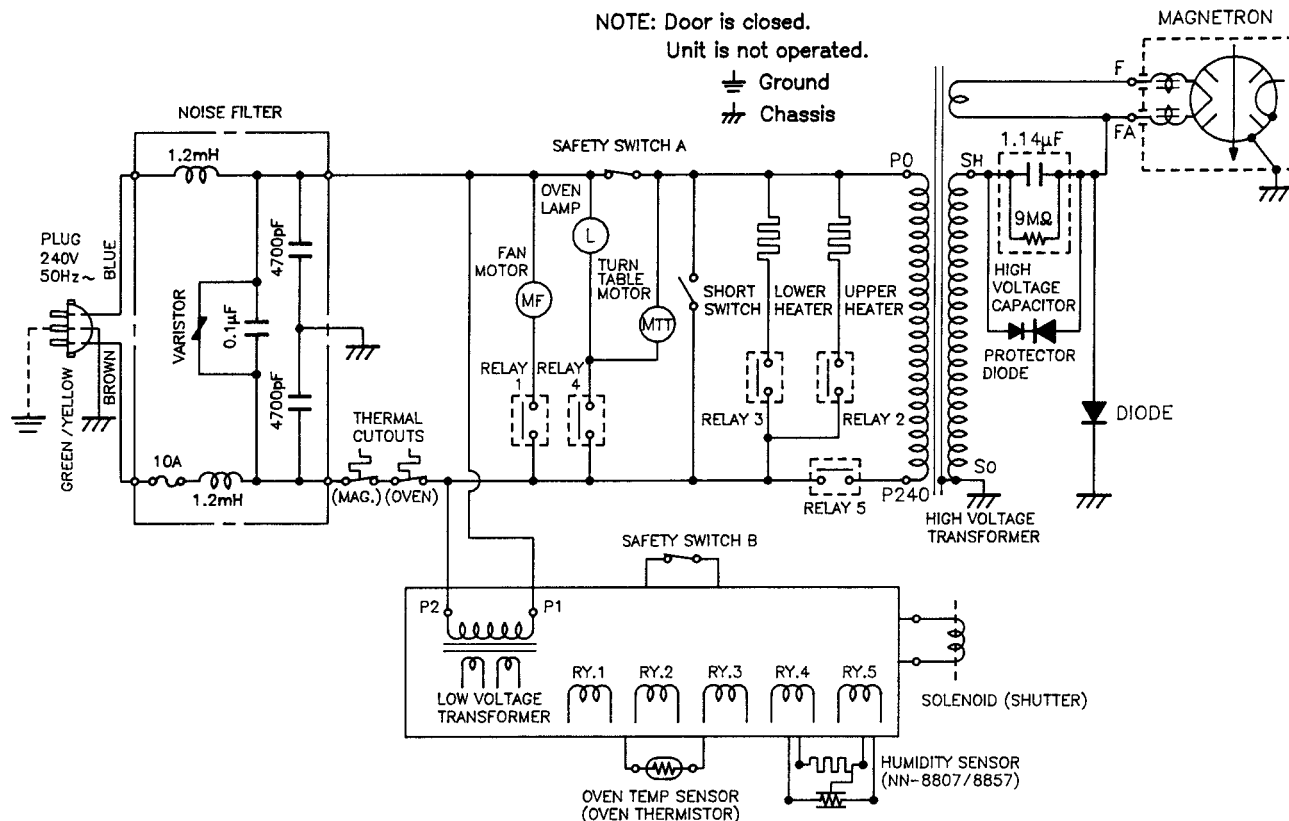
**For Combination Cooking
(Roasting)**



**For Combination Cooking
(Cooking Pastry Plaits, Pizza
etc.)**

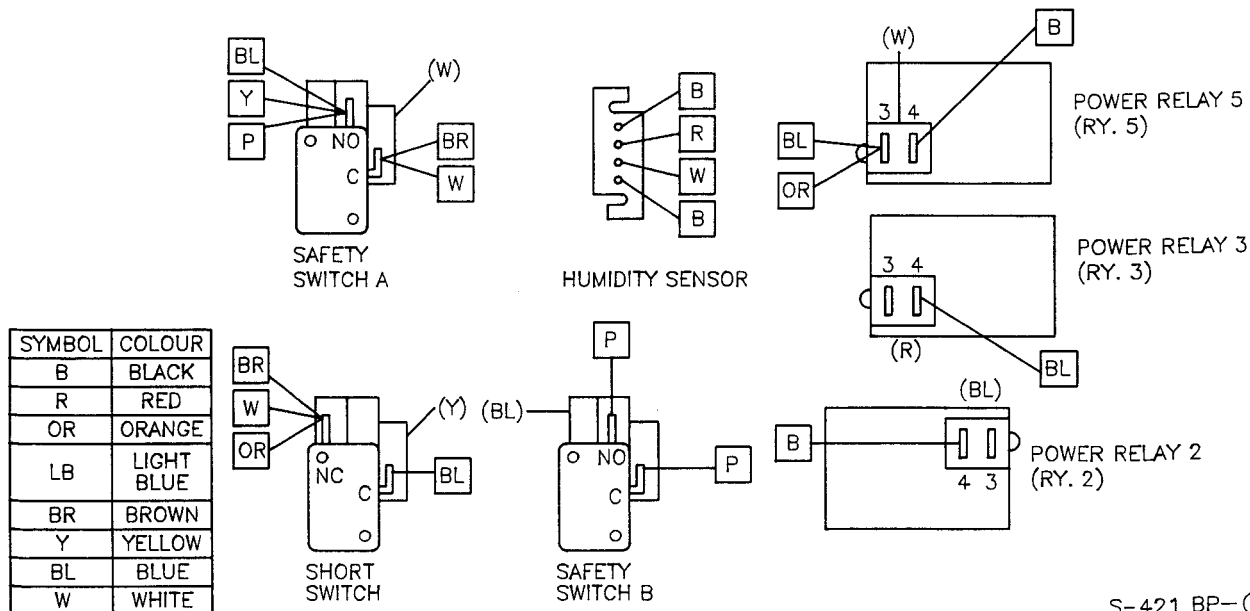


SCHEMATIC DIAGRAM (NN-8507/NN-8557/NN-8807/NN-8857 BPQ, PPQ)



WIRING DIAGRAM

NOTE: *When replacing, check the lead wire colour as shown.
*Colours shown by () indicate colours of lead wire connector housing.



S-421 BP-①

Fig. 1

DESCRIPTION OF OPERATING SEQUENCE

1. Variable power cooking control

The coil of power relay 5 (RY 5) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay 5 contacts in order to vary the output power of the microwave oven from "Warm" to "High" power.

One complete ON and OFF cycle of power relay 5 is 22 seconds.

The relation between indications on the control panel and the output of the microwave oven is as shown in Fig. 3.

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 1.5 seconds are required for heating of magnetron filament.

2. Cyclic defrost

When Defrost power and defrosting time is selected and Start pad is tapped:

- The digital programmer circuit (DPC) divides the total defrosting time into 8 cycles of alternating ON-OFF intervals of defrosting power and standing periods. (See Fig. 4)
- During each defrosting period, power relay 5 is energized for 9 seconds and de-energized for 13 seconds by DPC. (See Fig. 5)
- During standing periods, power relay 5 is always open resulting in no microwave power.

NOTE: Defrost time selected is converted into seconds by the DPC but display will show selected time in minutes and seconds as programmed. The total number of seconds is divided into 8 time periods. The remainder (seconds not equally divisible by 8) are added to the last standing time period.

Example 1: If defrosting time is selected for 2 minutes 56 seconds, each operating period will be as follows: (See Fig. 6)
2 minutes 56 seconds = 176 seconds
 $176/8 = 22$

NOTE: When defrosting time is selected for not more than 7 seconds, the power relay 5 will not be energized at all.

POWER SETTING	OUTPUT POWER(W) APPROX.	ON-OFF TIME OF POWER RELAY 5	
		ON(SEC)	OFF(SEC)
HIGH	700	22	0
MEDIUM	490	17	5
LOW	360	13	9
SIMMER	200	8	14
WARM	70	4	18
CYCLIC DEFROST	APPROX. 110W	Please refer to description of cyclic defrost	

Fig. 3

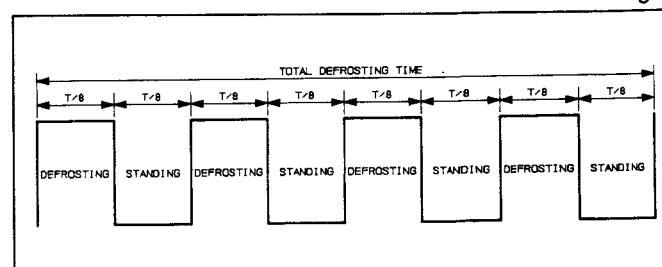


Fig. 4

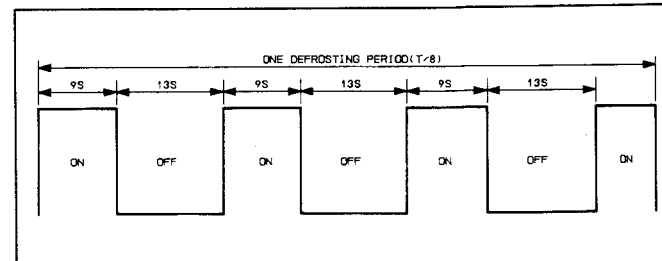


Fig. 5

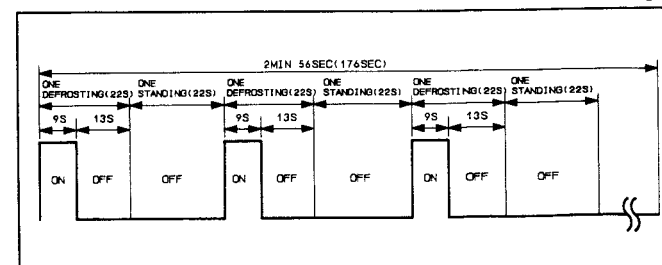


Fig. 6

3. Baking control (☐)

FLAT HEATER FOR LOWER HEATER

In this concept two heaters are used. One is sheathed heater located on top of oven cavity and another is flat heater located below the oven floor. They operate alternately to provide the necessary heat. The flat heater is a heating plate made by wrapping a ribbon heat strip around a compressed insulation wafer, then joining this surface to the floor of the oven.

The digital programmer circuit controls the alternating ON-OFF time of upper and lower heater in order to control the oven cavity temperature, see fig. 7, 8.

- After the start pad is tapped with the desired bake programme selected, an 18V DC comes out of the digital programmer circuit and is applied to the coil of power relay 2 and 3 alternately.
- When power relay 2 energizes, power source voltage (240V AC) is applied to the upper heater and oven temperature starts increasing.
- When the power relay 2 is deenergized, upper heater turns off and when power relay 3 is energized, the lower heater turns on.
- When the oven reaches the selected temperature, the digital programmer circuit senses the temperature through oven temp sensor and stops supplying 18V DC to the power relays 2 and 3 resulting in turn off of upper and lower heaters. After the heaters have been turned off, the oven temperature will continue to increase a while then decrease as shown in Fig. 8.
- When the oven temperature drops below selected temperature, the digital programmer circuit senses the oven temperature and starts supplying 18V DC to the coils of power relays 2 and 3 alternately again.

NOTE 1: ON-OFF time of upper heater and lower heater vary depending on the selected oven temperature as shown in Fig. 7. When baking is selected with temperature setting of 100-250°C, off period of both heaters is also programmed while oven temperature is lower than selected temperature, as shown in Fig. 7 and 8.

NOTE 2: After baking process, fan motor always rotates for 5 minutes to cool the electric components.

Heater ON-OFF Time for Baking

		ON TIME OF UPPER HEATER (TU)	ON TIME OF LOWER HEATER (TL)	OFF TIME OF BOTH HEATERS (TF)
Preheat for Baking		23 sec.	24 sec.	0
Baking	100°C~150°C	11 sec.	24 sec.	12 sec.
	160°C~170°C	7 sec.	20 sec.	20 sec.
	180°C	10 sec.	18 sec.	19 sec.
	190°C	9 sec.	22 sec.	16 sec.
	200°C~230°C	16 sec.	21 sec.	10 sec.
	240°C~250°C	18 sec.	24 sec.	5 sec.

Fig. 7

Baking (☐)

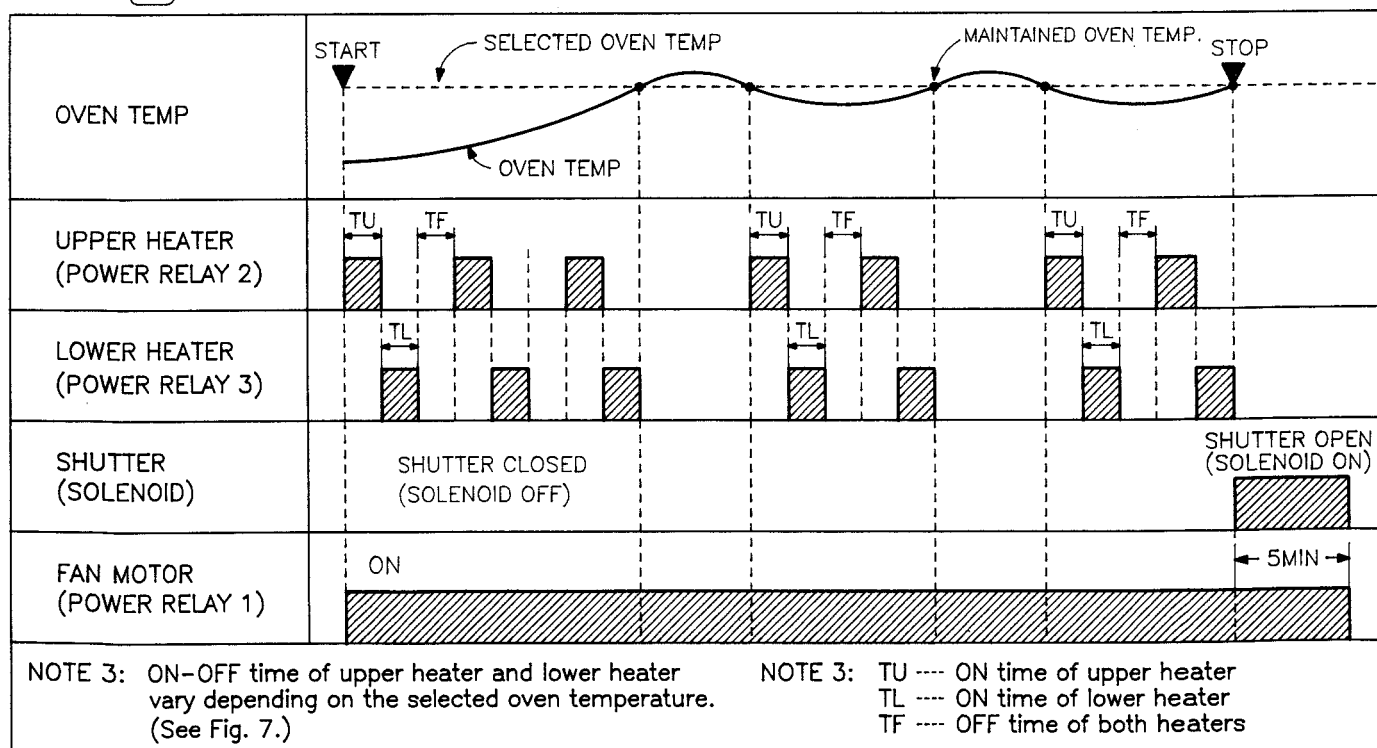


Fig. 8

4. Grill cooking control ()

The digital programmer circuit controls the ON-OFF time of the grill heater (upper heater) in order to control oven cavity temperature.

- (A) After the start pad is tapped with the desired grill programme set, an 18V DC comes out of the digital programmer circuit and is applied to coil of power relay 2 (RY 2).
- (B) When the contacts of power relay 2 close, power source voltage (240V AC) is applied to the grill heater and the grill heater turns on.
- (C) The temperatures by each category are preprogrammed in the microprocessor as shown in **Fig. 9**. When the oven temperature reaches the preprogrammed temperature, the digital programmer circuit senses the temperature rise through oven temp sensor and stops supplying an 18V DC to the coil of power relay 2 and the grill heater turns off.
- (D) After the grill heater turns off, the oven temperature will continue increasing a while and then decrease as shown in **Fig. 10**. When the oven temperature drops below the preprogrammed temperature, the digital programmer circuit senses the oven temperature and starts supplying an 18V DC to the coil of power relay 2 again.
- (E) When 30 minutes have elapsed, the digital programmer circuit starts cycling to supply an 18V DC to power relay 2 at a rate of two minutes OFF and one minute ON until cooking programme is completed.

NOTE 1: After grill process, fan motor always rotates for 5 minutes to cool the electric components.

NOTE 2: When grill category 2 is selected, the shutter remains at closed position during cooking.

Grill Cooking Temperature

CATEGORY	OVEN TEMP
1	Approx. 270°C
2	Approx. 230°C

Fig. 9

Grill Cooking () (When grill category 1 is selected)

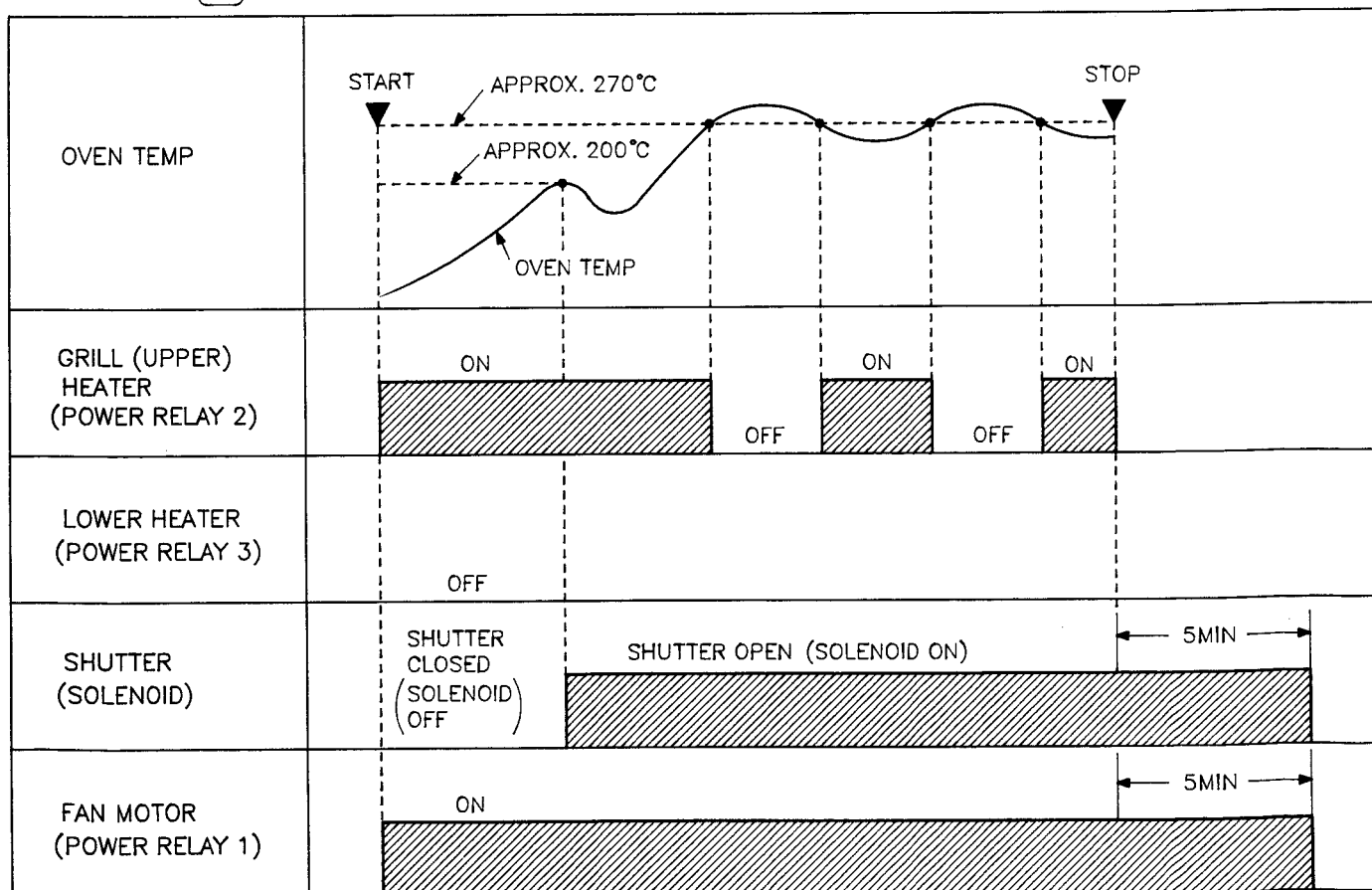


Fig. 10

5. Combination cooking control ()

Combination cooking is accomplished by operating the microwave and heater mode alternately during one combination cooking cycle. One combination cooking cycle is 60 seconds or 47 seconds depending on the program.

- (A) The digital programmer circuit generates the power relay 2, 3 and 5 control signals at a specific timing as shown in Fig. 11.
- (B) When the oven temperature reaches the predetermined temperature, the digital programmer circuit stops supplying power relay 2 and 3 control signals resulting in both upper and lower heaters to turn off. During this, digital programmer circuit continues supplying power relay 5 control signal so that microwave activity continues at predetermined duty ratio as shown in Fig. 11. The microwave activity continues to cycle until entire cooking programme is completed.
- (C) When the oven temperature drops below the predetermined temperature, the digital programmer circuit generates power relay 2 and 3 control signals again at the timing predetermined.

NOTE 1: The power relays 2, 3 and 5 do not turn on at the same time. Any of two power relays of them should be always off so that input current always remains within allowable main current (10A).

NOTE 2: After combination cooking process, fan motor always rotates for 5 minutes to cool the electric components.

Combination Cooking (When combination category 3 is selected.) ()

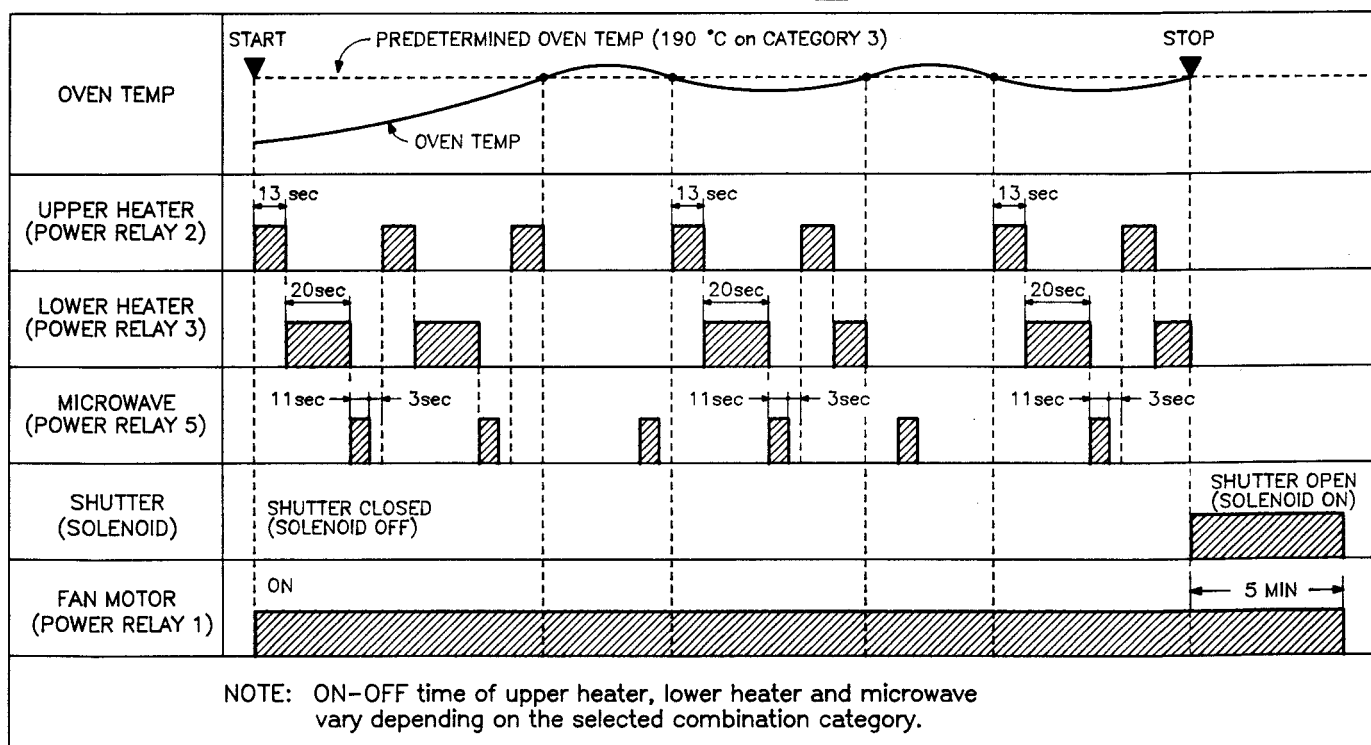


Fig. 11

6. Auto weight combination cooking control ()

When the Auto Weight Control, Combination Cooking feature is selected by tapping the appropriate key pads and Start pad is tapped.

- (A) The digital programmer circuit determines the power level, oven temperature and combination cooking time to complete combination cooking and indicates the operating state in the display window. Fig. 12 shows the combination cooking times for respective weights by categories.
- (B) When the combination cooking time in the display window has elapsed, the oven turns off automatically by the controlled signal from the digital programmer circuit.

Auto Weight Combination ()

WEIGHT SELECTED	TOTAL COMBINATION COOKING TIME		
	CATEGORY 1	CATEGORY 2	CATEGORY 3
1 kg	31 min. 30 sec.	37 min. 55 sec.	40 min. 15 sec.
3 kg	1 hour 34 min.	1 hour 53 min.	2 hour 00 min.
	CATEGORY 4	CATEGORY 5	CATEGORY 6
1 kg	40 min. 15 sec.	40 min. 15 sec.	33 min. 25 sec.
3 kg	2 hour 00 min.	2 hour 00 min.	1 hour 15 min.

Fig. 12

7. Auto reheat combination cooking control ()

Auto reheat combination cooking is accomplished by operating of the microwave and heater mode alternately during one cooking cycle. One auto reheat combination cooking cycle is 61 seconds.

When this feature is selected by tapping the appropriate key pads and the start pad is tapped:

(A) The digital programmer circuit determines the power level, oven temperature and combination cooking time to complete combination cooking and indicates the operating state in the display window. **Fig. 13** shows the corresponding cooking times with respective serving by categories.

(B) When cooking time in the display window has elapsed, the oven turns off automatically by the controlled signal from the digital programmer circuit.

NOTE: After auto reheat combination cooking process, fan motor always rotates for 5 minutes to cool the electric components.

Auto Reheat Combination ()

CATEGORY \ SERVING	1	2	3
1	8 min. 00 sec.	10 min. 00 sec.	10 min. 00 sec.
2	10 min. 00 sec.	15 min. 00 sec.	15 min. 00 sec.

Fig. 13

AUTO SENSOR EXPLANATION, K FACTORS AND POWER LEVELS (For NN-8807, NN-8857 only)

1. Auto sensor cooking

Auto sensor cooking is a revolutionary way to cook by microwave without setting a power level or selecting a time.

All that is necessary is to select an Auto Sensor Program before starting to cook.

Understanding of Auto Sensor Cooking

As a food cooks, a certain amount of steam is produced. If the food is covered, this steam builds up and eventually escapes from the container. In Auto Sensor Cooking, a carefully designed instrument, called the humidity sensor element, senses this escape of steam. Then, based upon the Auto Sensor Program selected, the unit will automatically determine the correct power level and the proper length of time it will take to cook the food.

NOTE: Auto Sensor Cooking is successful with the foods and recipes found in the Auto Sensor Cooking Guide. Because of the vast differences in food composition, items not mentioned in the Cooking Guide should be prepared in the microwave oven using power select and time features. Please consult Microwave Cookbook for procedures.

2. Auto sensor cooking process

Explanation of the Auto Sensor Cooking process (See Fig. 14A)

- 1) The shaded columns in the graph indicate when the humidity sensor heater is on.
- 2) During the first 60 second period there is no microwave activity, and when calculating the T2 time by using the formula below make sure this 60 seconds is subtracted from the T1 time. In other words T1 time starts at the end of the 60 second period. (This 60 second period is needed for the sensor element to stabilize and balance itself to the humidity present before microwave activity starts.)
- 3) T1 time.....The total amount of time it takes the microwave oven to switch to T2 time after the 60 second period. During this time one of the Auto Sensor programs (A1-A8) will be shown in display.
- 4) T2 time.....When the steam escapes from the cooking container placed in the oven, the humidity sensor detects it and the microprocessor calculates the balance of cooking time. This T2 time is then shown in the display and begins counting down.

NOTE: If T1 time is over 60 minutes, oven stops automatically and "FF FF" appears in display window.

Balance of cooking time (T2 time)

The balance of cooking time which is called T2 time, can be calculated by the following formula.

$$T2 \text{ time (in sec.)} = T1 \text{ time} \times K \text{ factor}$$

NOTE: When calculating T2 time, the last digit of T1 time in seconds is cut away. For instance, if the T1 time is 76 seconds, the T2 time will be:

$$T2 = 70 \times K$$

Remember, the T1 time starts after the 60 second period. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powers. (See Fig. 14B)

NOTE: When "More" or "Less" pad is selected, the K factor varies as shown in Fig. 14B resulting in T2 time to be increased or decreased.

Example of calculating the T2 time

Example 1: If the T1 time is measured to be 2 minutes and 45 seconds after the 60 second period, and the Auto program selected is

(COOK) A5:

$$\begin{aligned} T2 &= T1 \times K \\ &= 2 \text{ min. and } 45 \text{ sec.} \times 0.9 \\ &= 160 \text{ sec.} \times 0.9 \\ &= 144 \text{ sec.} \\ &= 2 \text{ min. and } 24 \text{ sec.} \end{aligned}$$

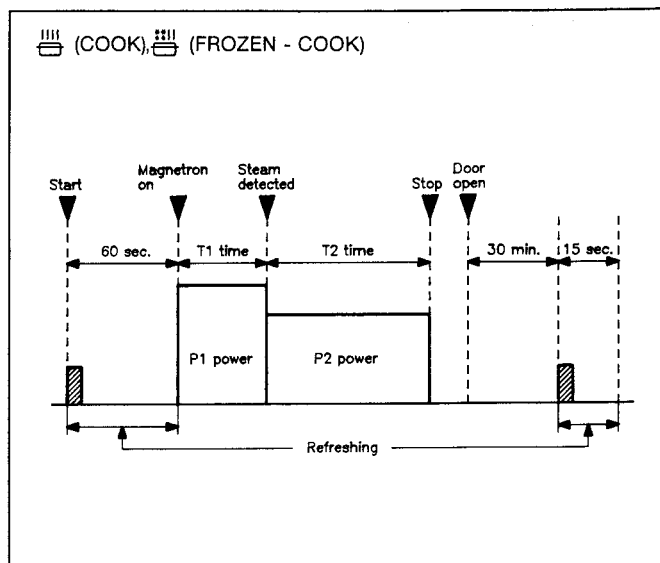


Fig. 14A

(COOK)					
	P1 Power	P2 Power	K factor		
			Standard	More	Less
A1	HIGH	HIGH	0.1	approx. 0.1	approx. 0.1
A5	HIGH	HIGH	0.9	approx. 1.1	approx. 0.7

Fig. 14B

CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

2. Warning about the electric charge in the high voltage capacitor (Fig. 15)

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.

When replacing or checking parts, turn the oven off, wait 30 seconds and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver or an insulated jumper lead wire to discharge.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized.

DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor even with an insulated tool during operation.

3. When parts must be replaced, remove the power plug from the outlet.

4. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal objects through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.

5. Confirm after repair

(A) After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing.

Microwaves might leak if screws are not properly tightened.

(B) Make sure that all electrical connections are tight before inserting the plug into the wall outlet.

6. The special connection cable used for connection of this apparatus may be replaced only by qualified service-personnel using a special cable, which can be obtained only from the "Panasonic" - Service. (Refer to Parts List.)

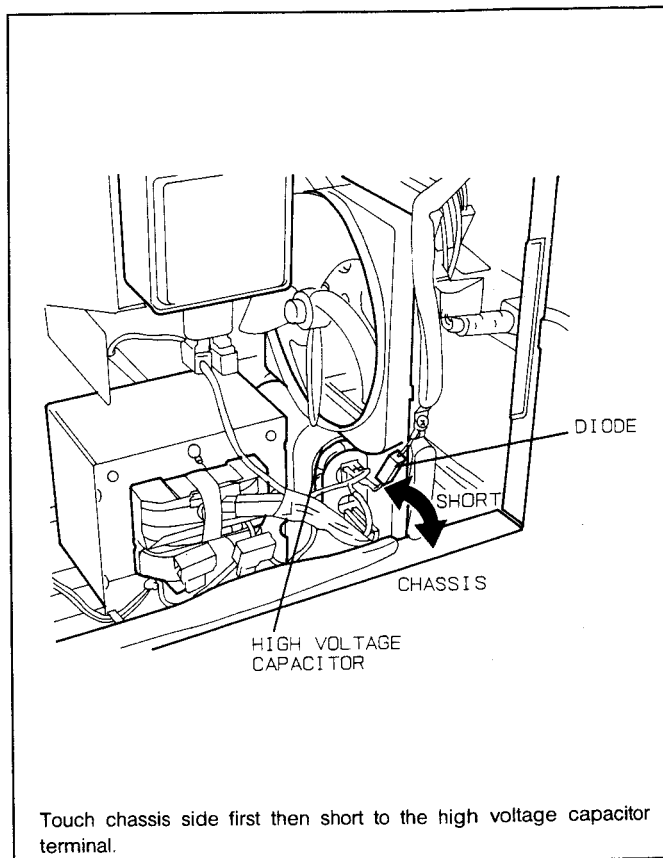


Fig. 15

DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

1. Replacement of the magnetron

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

- (A) Discharge the high voltage capacitor. (See page 13)
- (B) Remove 2 screws holding thermal cutout.
- (C) Remove 4 screws holding air guide A and E. (Fig. 16A & 16B)
- (D) Remove 2 high voltage leads from filament terminals. (F, FA)
- (E) Remove 4 screws holding the magnetron. (Fig. 16B)

NOTE: To prevent microwave leakage, tighten mounting screws properly making sure there is no gap between the waveguide and the magnetron.

CAUTION

When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high voltage transformer should be connected to "F terminal" and the lead wire from high voltage capacitor should be connected to "FA terminal". (See Fig. 16B)

2. Replacement of the fan motor

- (A) Remove the magnetron.
- (B) Disconnect 2 lead wires from the fan motor terminals.
- (C) Remove fan blade from the fan motor shaft by pulling it straight out.
- (D) Remove 2 screws holding the fan motor.

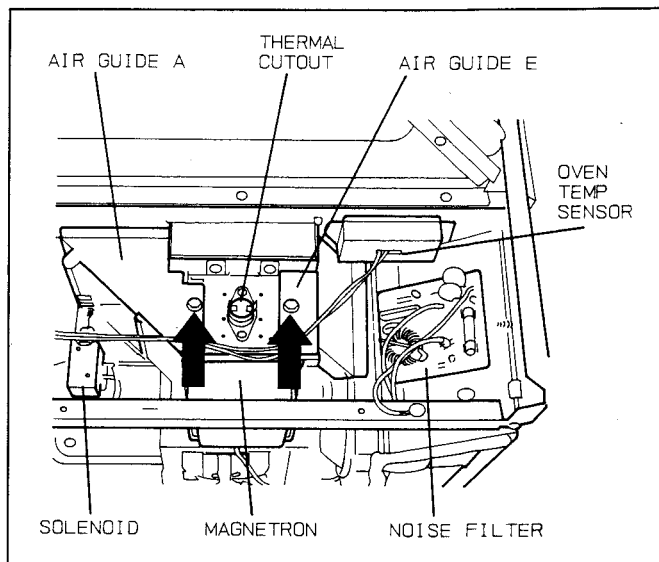


Fig. 16A

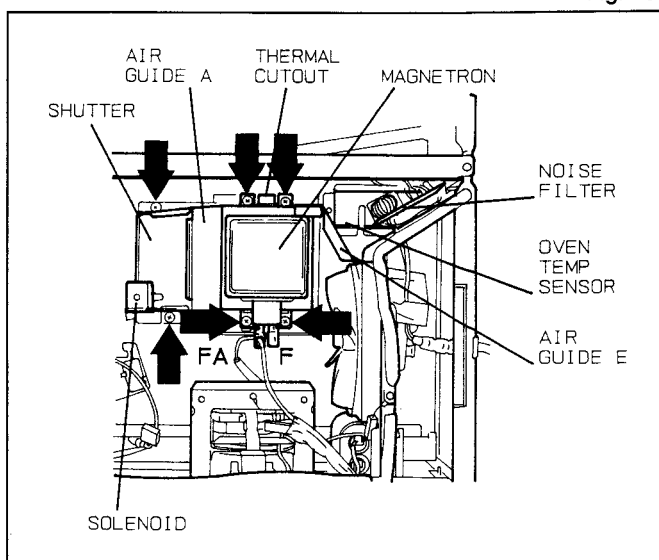


Fig. 16B

3. Replacement of the digital programmer circuit (D.P.C.) and membrane key board.

NOTE: Be sure to ground any static electric charge built up on your body, before handling the D.P.C..

Removal of Special Lock connector

The lock connector is a specially designed loose free connector and you will find this connector on the DPC.

To remove this connector, press the locking lever of the connector by using flat screwdriver as shown in **Fig. 17** and pull the lead wire.

- Unplug the 7-pin connector (CN2) from the D.P.C.. (NN-8807, NN-8857 only) (**Fig. 18B**)
- Unplug 6-pin (CN1), 4-pin (CN3) and 5-pin (CN5) connectors from the D.P.C.. (**Fig. 18B**)
- Disconnect all lead wires from the power relay 2, 3 and 5. (**Fig. 18B**)
- Remove 2 screws holding the escutcheon base. (**Fig. 18A**)
- Release CN4 connector's lid of the D.P.C. and pull off the flat cable of the membrane switch. (**Fig. 18B**)
- Remove 4 screws holding the D.P.C. (**Fig. 18B**)

To replace membrane key board

- Remove 2 screws holding escutcheon bracket and detach the escutcheon bracket from escutcheon base. (**Fig. 18B**)
- Remove 1 screw holding membrane key board's tab and peel off the membrane key board from the escutcheon bracket. (**Fig. 19**)

NOTE 1: The membrane key board is attached to the escutcheon bracket with double faced adhesive tape.

NOTE 2: When installing new membrane key board, make sure that the surface of the escutcheon bracket is cleaned sufficiently so that any problem (shorted contacts or uneven surface) can be avoided.

NOTE 3: Make sure new membrane keyboard is aligned to the left and lower edges of the escutcheon bracket. (**Fig. 19**)

4. Replacement of the low voltage transformer and/or power relays (RY 1, RY 2, RY 3, RY 4, RY 5) (**Fig. 18B**)

NOTE: Be sure to ground any static electric charge built up on your body before handling the D.P.C.

- Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer or power relays (RY 1, RY 2, RY 3, RY 4, RY 5).

NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on D.P.C. board.

- With all the terminal pins cleaned and separated from D.P.C. contacts, remove the defective transformer/power relay and install new transformer/power relay making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.

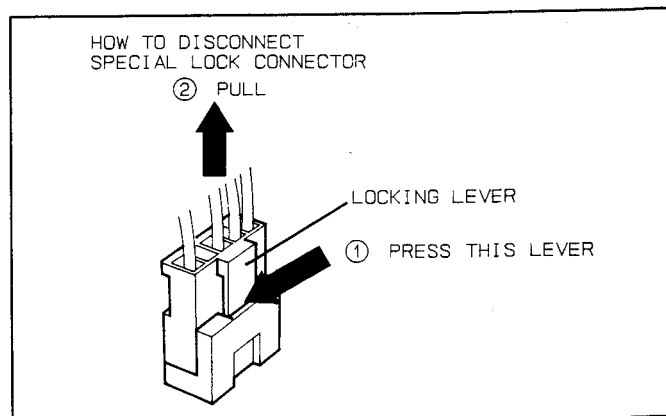


Fig. 17

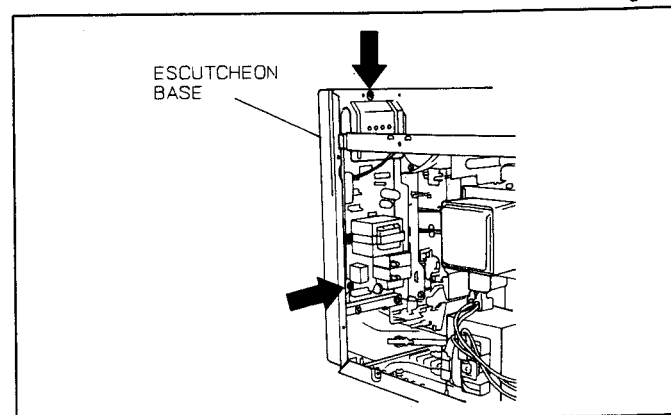


Fig. 18A

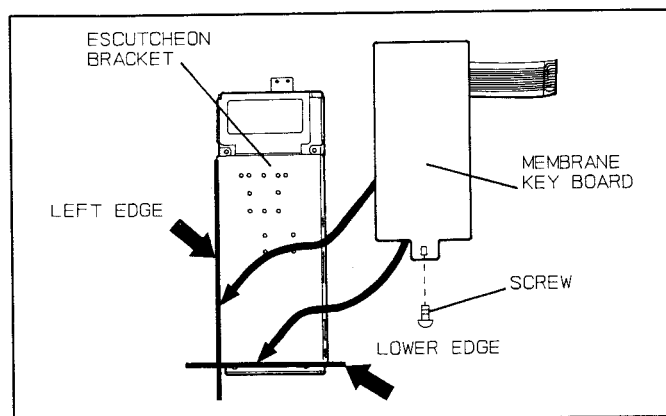


Fig. 19

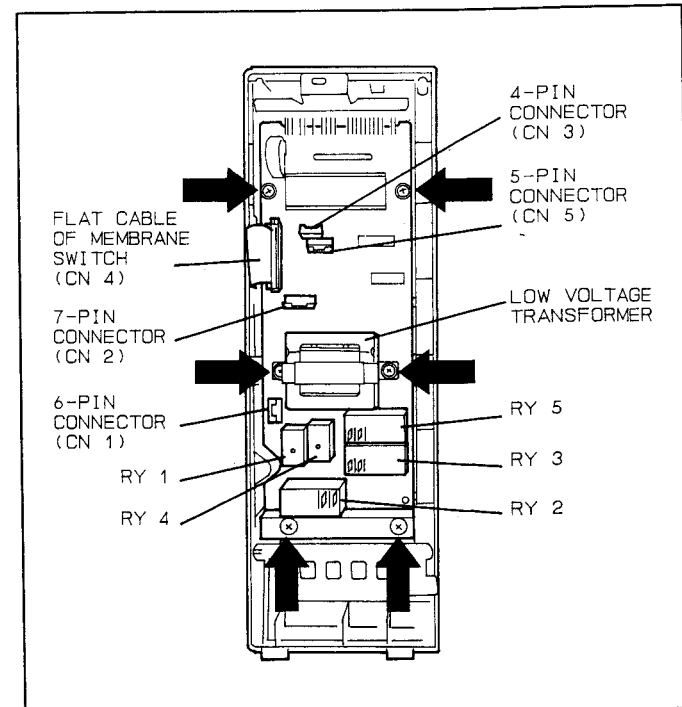


Fig. 18B

5. Disassembly and replacement of the door assembly.

- (A) Remove 2 bolts holding the upper hinge to the oven.
(B) Open the door and while pulling the door toward you, work the upper hinge out through the hole in the oven.

NOTE: Do not lose spacer at the bottom hinge.

- (C) Remove 4 screws holding the door C. (Fig. 21)
(D) Remove the door C by carefully pulling outward starting from the upper right hand corner.
(E) Remove door key spring and remove 3 screws holding door handle. (Fig. 22)
(F) Separate the door A from door E by carefully freeing the 6 catch hooks on door A while pulling outward. (See Fig. 23)
(G) Remove door keys, door key lever and handle pins from the door E. (Fig. 22)
(H) When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment. (Fig. 24)
Also adjust so that the door has no play between the inner door surface and oven frame. If the door is not mounted properly, microwave may leak from the clearance between the door and the oven.
(I) Perform the microwave leakage test after replacing or adjusting any oven door part.

6. Replacement of the grill heater (Upper heater)

- (A) Remove 2 grill heater lead wires by removing 2 screws.
(B) Remove 2 heater supports by removing 2 screws. (Fig. 25)
(C) Remove 3 screws holding grill heater. (Fig. 26)

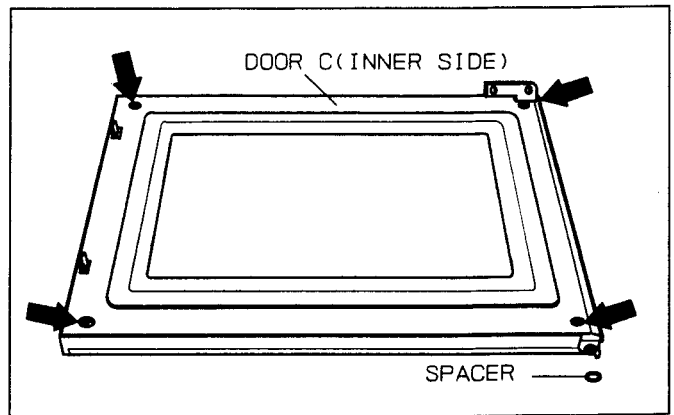


Fig. 21

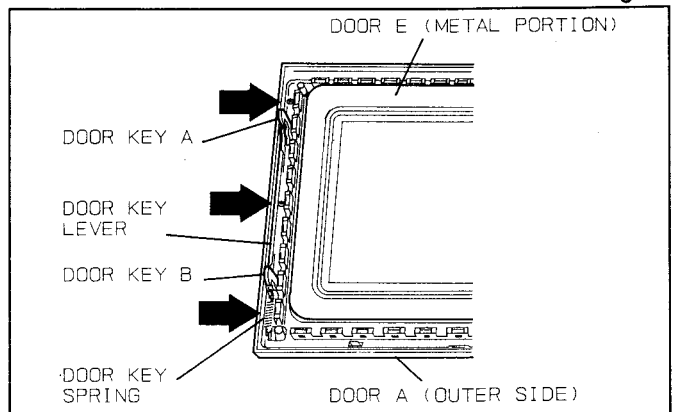


Fig. 22

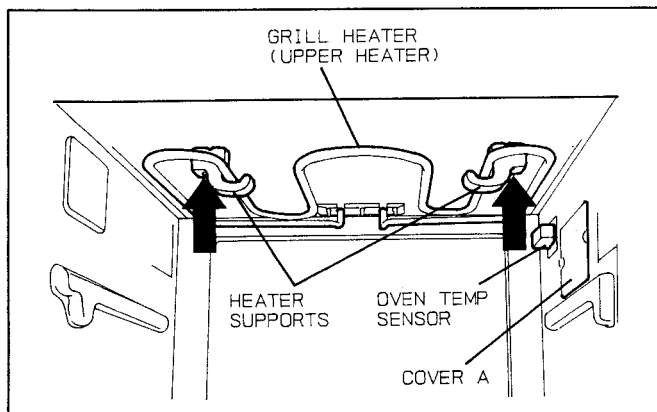


Fig. 25

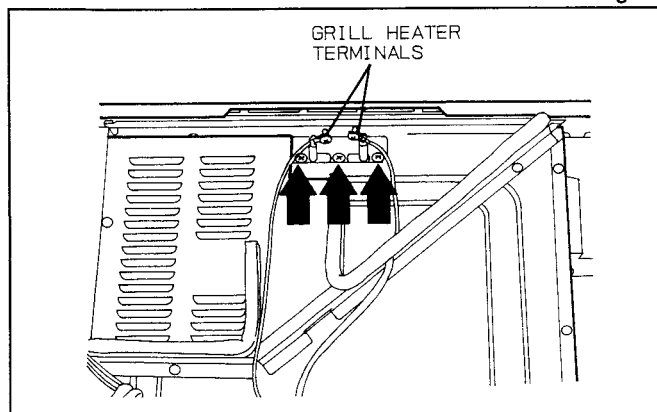


Fig. 26

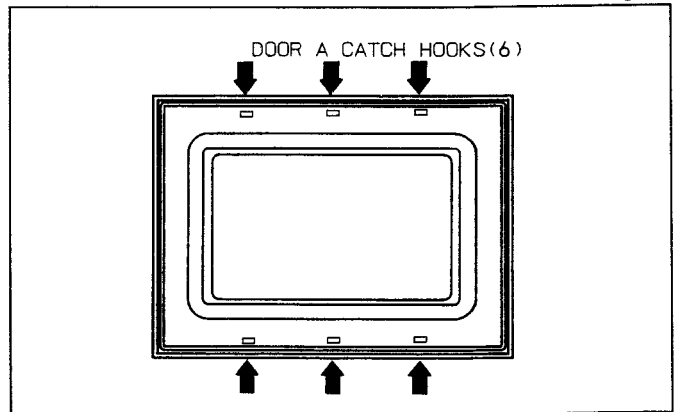


Fig. 23

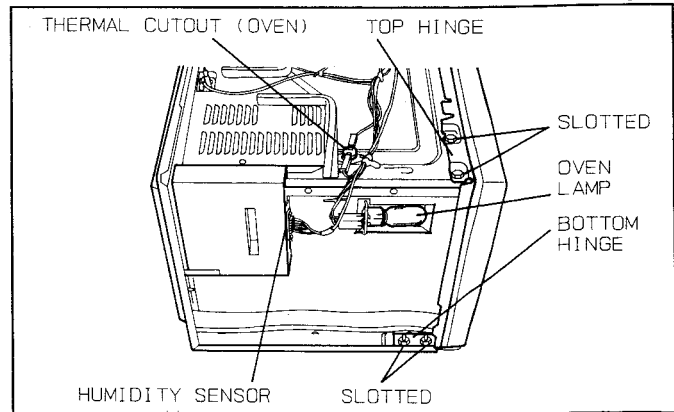


Fig. 24

7. Replacement of the lower heater (Heater A)

- (A) Remove the glass ceramic tray and the turntable from oven cavity.
- (B) Carefully turn the oven up side down.
- (C) Remove the base C by removing 2 screws. (Fig. 27)
- (D) Disconnect the turntable motor connector.
- (E) Remove 2 screws holding 2 heater terminals and 2 power supply lead wires. (Fig. 28)
- (F) Remove the motor stopper by removing a screw. (Fig. 28)
- (G) Remove the turntable motor by removing 2 screws.
- (H) Remove the motor bracket by removing 3 screws. (Fig. 29)
- (I) Remove the lower heater panel by removing 5 screws. Be carefull of air guide G. (Fig. 30)
- (J) Remove the adiabatic material A.
- (K) Remove the lower heater (heater A) by freeing the 4 hooks and removing 2 screws. (Fig. 31)

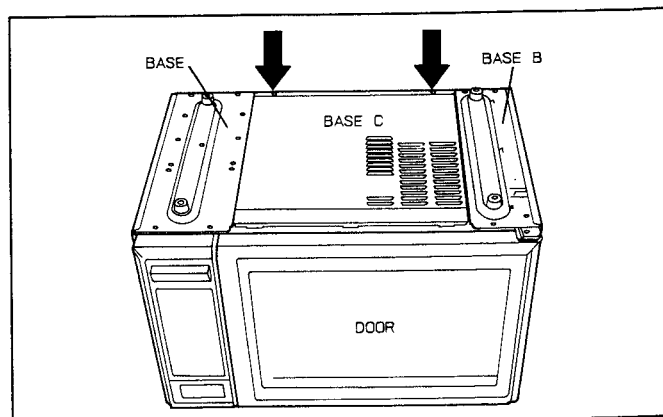


Fig. 27

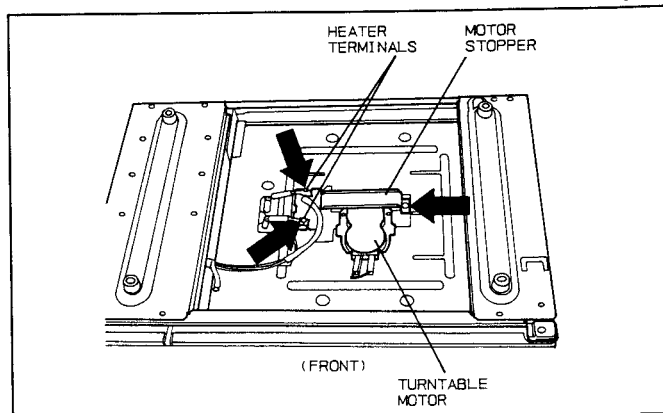


Fig. 28

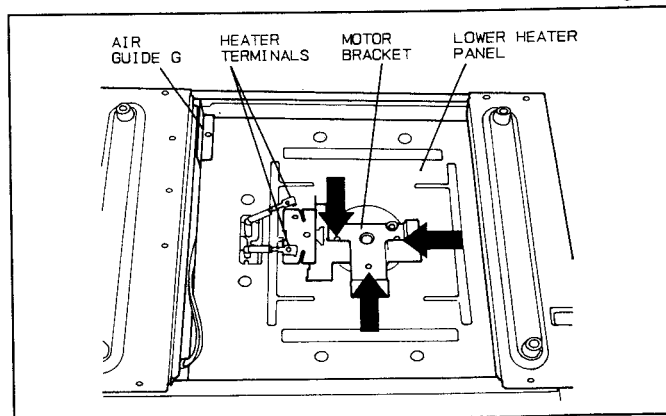


Fig. 29

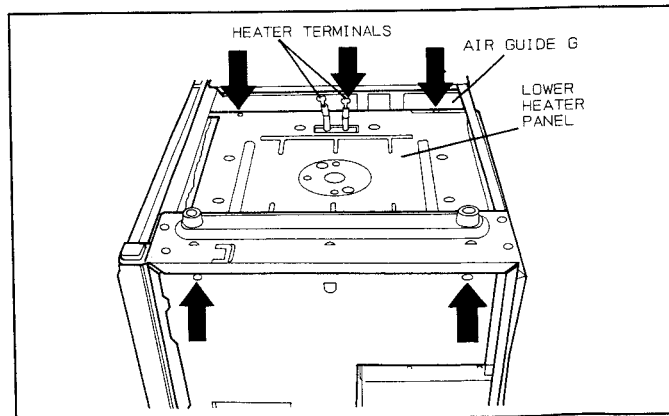


Fig. 30

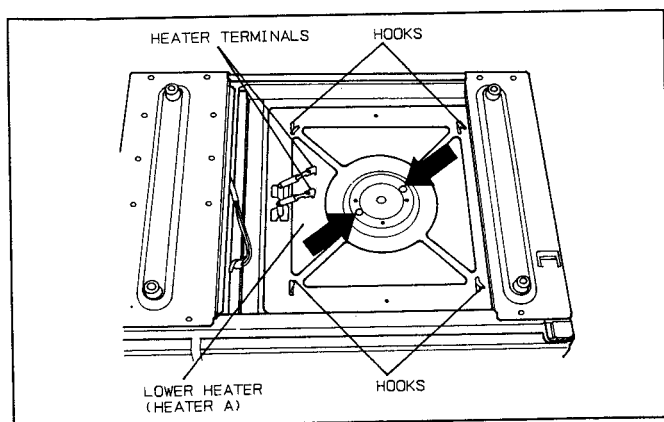


Fig. 31

COMPONENT TEST PROCEDURE

CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor. (See page 13.)

1. High voltage transformer (refer to Fig. 32)

- (A) Remove connections from the transformer terminals and check continuity.
- (B) Normal (cold) resistance readings should be as follows:
- | | |
|-----------------------------|----------------------|
| Secondary winding | Approx. 80 Ω ~ 120 Ω |
| Filament winding | Approx. 0 Ω |
| Primary winding (0V ~ 240V) | Approx. 0 Ω ~ 3 Ω |

2. High voltage capacitor

- (A) Check continuity of capacitor with ohmmeter on highest OHM scale.
- (B) A normal capacitor will show continuity for a short time, and then indicate 9MΩ once the capacitor is charged.
- (C) A shorted capacitor will show continuous continuity.
- (D) An open capacitor will show constant 9MΩ.
 ((Due to internal 9MΩ resistor))
- (E) Resistance between each terminal and chassis should be infinite.

3. Diode

- (A) Isolate the diode assembly from the circuit by disconnecting the leads.
- (B) With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.
 A normal diode's resistance will be infinite in one direction and several hundred KΩ in the other direction.

4. Magnetron (Fig. 34)

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron,

- (A) Isolate magnetron from the circuit by disconnecting the leads.
- (B) A continuity check across magnetron filament terminals should indicate one ohm or less.
- (C) A continuity check between each filament terminal and magnetron case should read open.

5. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by pressing an appropriate pad on the key board.
 The contacts assignment of the respective pads on the key board is as shown in Fig. 33.

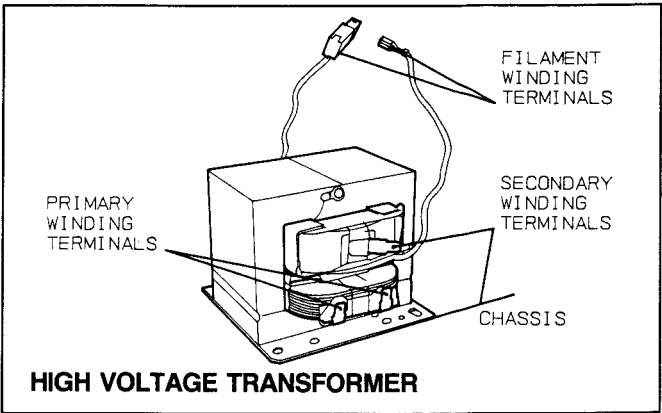


Fig. 32

PAD	CONNECTORS
START	6 — 1
STOP/CANCEL	6 — 2
1 Kg/1 LB	6 — 3
0.1 Kg/1 OZ	6 — 4
LESS	7 — 2
MORE	7 — 3
CLOCK	7 — 4
Kg ↔ LB, OZ	7 — 5
1 SEC (MIN)	8 — 2
10 SEC (MIN)	8 — 3
1 MIN	8 — 4
10 MIN (H)	8 — 5
GRILL	9 — 2
BAKE	9 — 3
COMBINATION	9 — 4
POWER	9 — 5
AUTO SENSOR COOKING	10 — 2
AUTO WEIGHT COMBINATION	10 — 3
DEFROST	10 — 5
DELAY/STAND	11 — 2
AUTO SENSOR COOKING	11 — 5
AUTO REHEAT COMBINATION 1	12 — 2
AUTO REHEAT COMBINATION 2	12 — 3
AUTO REHEAT COMBINATION 3	12 — 4

※For NN-8807/8857
 MEMBRANE KEY BOARD

Fig. 33

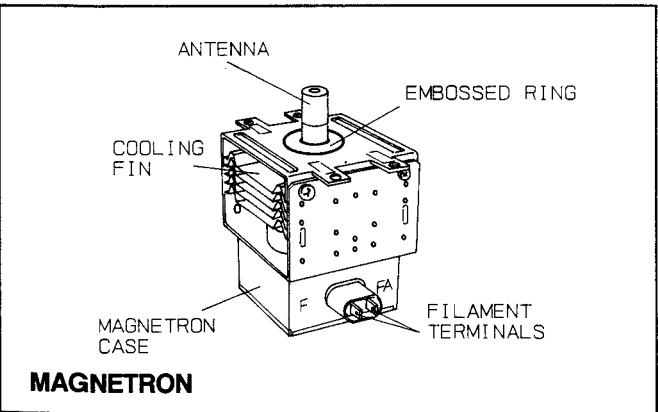


Fig. 34

6. Humidity Sensor and digital programmer circuit (Fig. 35) (NN-8807/8857)

CAUTION

Do not touch any parts of the circuitry on the digital programmer circuit since static electric discharge may damage this control panel. Always ground yourself while working on this panel to discharge any static charge built up on your body.

- (A) Check across sensor heater terminals. Normal cold resistance should read approx. 6 ohm.
- (B) In order to determine if the Auto Sensor function of the digital programmer circuit is in working order or not, do the following test.
 - 1) Place a water load in the oven.
 - 2) Unsolder white and red wires connected to sensor terminals.
 - 3) Tap Auto Sensor Fresh Foods Pad () five times to set auto sensor cooking at A5 and tap Start Pad.
 - 4) About 10 seconds after Start Pad is touched, short white and red wires for 5 seconds and then remove them. Before shorting the white and red wires you can watch the sensor heater glow red.
 - 5) The oven lamp will dim a little, about 60 seconds after the Start Pad is tapped. This indicates that magnetron has started oscillation.
 - 6) After approx. *10 seconds (T1 TIME), short the white and red wires again.
 - 7) A5 should disappear in display window and following digits (see chart) should appear indicating **balance of cooking time (T2 TIME).The time should start to count down and oven should shut off when the time has elapsed.

* T1 TIME	** T2 TIME (balance of cooking time)
10 sec.~19 sec.	9 sec.
20 sec.~29 sec.	18 sec.

The Auto Sensor function in the digital programmer circuit is working in order if above condition is obtained.

7. Protector diode (Fig. 36)

- (A) Isolate the protector diode assembly from the circuit by disconnecting its leads.
- (B) With the ohmmeter set on the highest resistance scale, measure the resistance across the protector diode terminals. Reverse the meter leads and again observe the resistance reading. A normal protector diode's resistance will be infinite in both directions. It is faulty if it shows continuity in one or both directions.

8. To test the oven temp sensor thermistor

This sensor monitors the heat produced by the heater circuit and maintains the oven temperature the user had selected. Normal room temperature, especially in a kitchen can vary anywhere from 10°C to 32°C. The reading across the oven sensor thermistor should be within 360K ohm to 800K ohm when reading in an area within the 10°C to 32°C room temperature range.

If the resistance reading is out of the range stated here, the sensor is defective and must be replaced.

NOTE 1: When measuring resistance disconnect the 4-pin connector (CN3) from the DPC otherwise a false reading may be indicated.

NOTE 2: If checking an oven sensor thermistor just after the microwave oven has been operating, the sensor of course won't be room temperature. In this case the sensor must be removed and allowed to cool down to the 10°C to 32°C range.

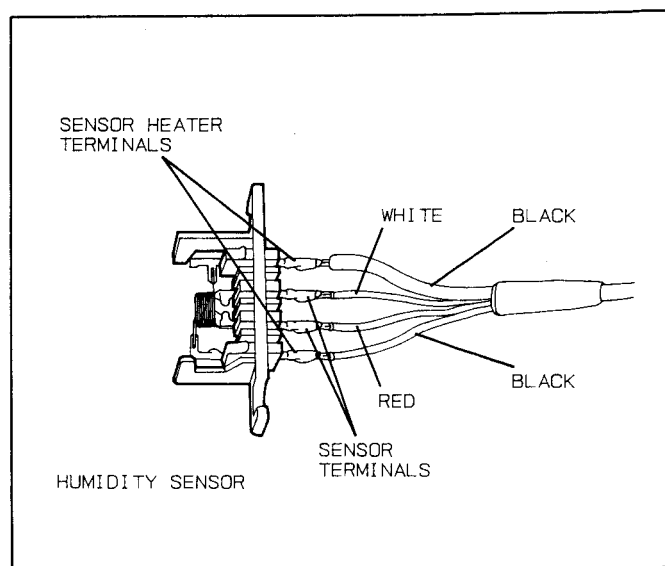


Fig. 35

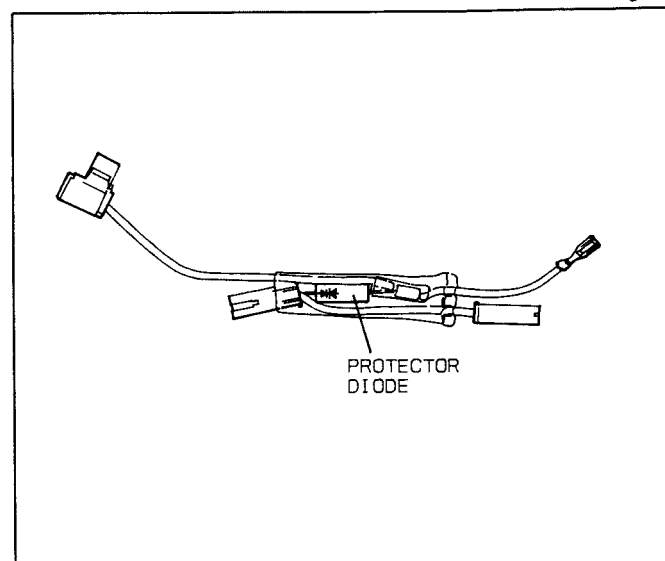


Fig 36

MEASUREMENTS AND ADJUSTMENTS

1. Adjustment of safety switch A, safety switch B and short switch

(A) When mounting the safety switch A, safety switch B and short switch to the door hook assembly, mount the safety switch A, safety switch B and short switch to the door hook assembly as shown in **Fig. 37**.

NOTE: No specific adjustment during installation of safety switch A, safety switch B and short switch to the door hook is necessary.

(B) When mounting the door hook assembly to the oven assembly, adjust the door hook by moving it in the direction of arrow in **Fig. 38** so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Securely tighten the screws holding the door hook assembly to the oven assembly.

2. Measurement of microwave output

The power output of the magnetron can be determined by performing a simple water heating test as described below.

Necessary Equipment:

*Two 1 litre beakers *Glass thermometer

*Wrist watch or stopwatch

NOTE: Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.

(A) Fill each beaker with exactly one litre of tap water. Stir the water using the thermometer and record each beaker's temperature (recorded as T1A and T1B).

(B) Place both beakers on the center of glass cook plate. Set the oven for High power and heat it for exactly two minutes.

(C) Stir the water again and read the temperature of each beaker (recorded as T2A and T2B).

(D) Obtain the temperature rise by using the following formula:

$$\text{Average temperature rise} = \frac{(T2A + T2B) - (T1A + T1B)}{2}$$

The normal temperature rise for these models should be 8.9° to 11°C at the "High" power selection with the oven operating at the specified line voltage.

(E) To obtain the power output, multiply the average temperature rise by 70.

Example:

If you find average temperature rise of 10°C, the ovens output is
 $10 \times 70 = 700$ watts.

NOTE: This test may be conducted by heating one litre of water for one minute if only one beaker is available. In this instance you will find the temperature rise being smaller than the above specifications due to the microwave absorption characteristic. You may judge the magnetron to be normal when the temperature rise is greater than 7.5°C.

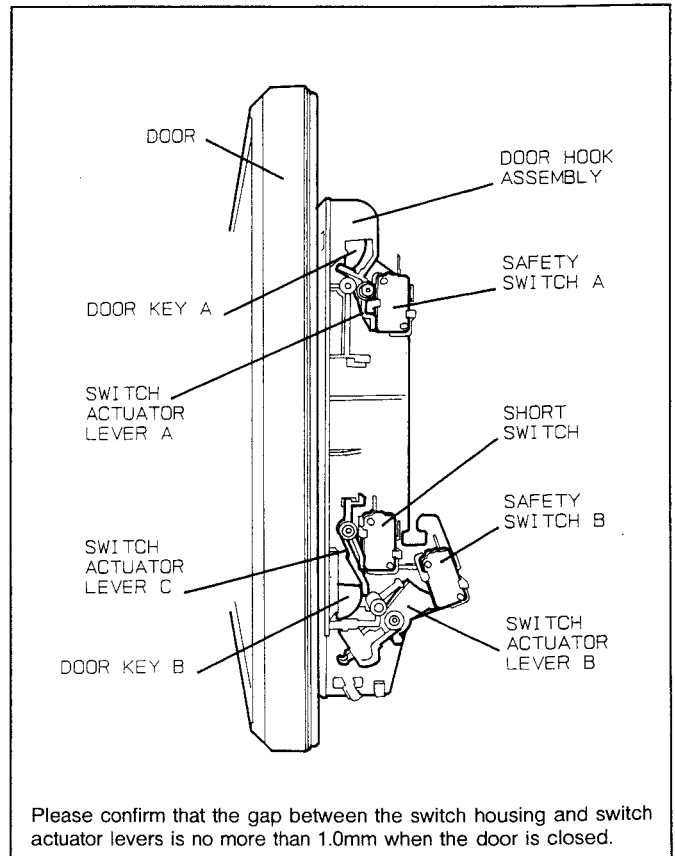


Fig. 37

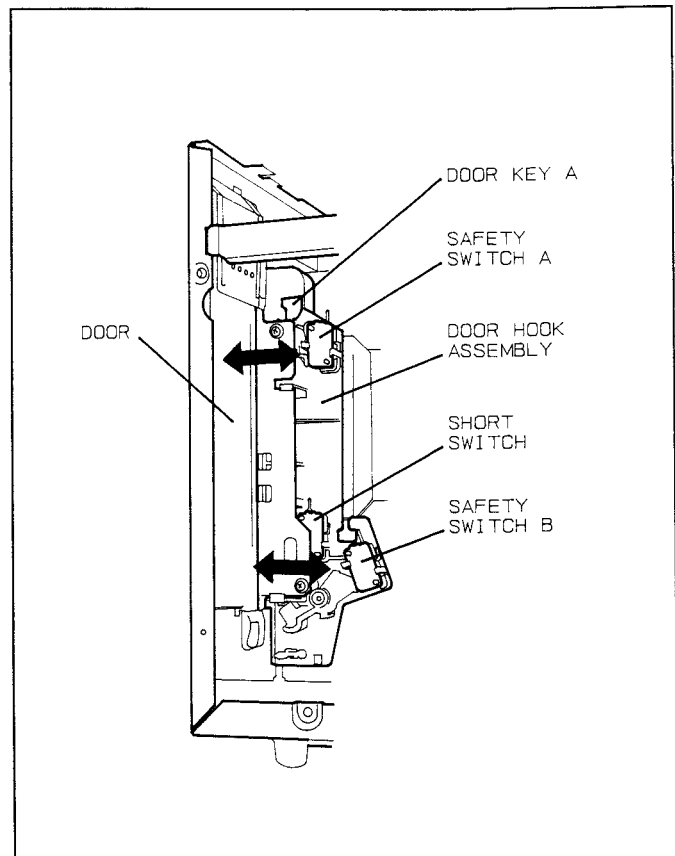


Fig. 38

TROUBLESHOOTING GUIDE

CAUTION

1. Check grounding before checking for trouble.
2. Be careful of the high voltage circuit.
3. Discharge high voltage capacitor. (See page 13.)
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
5. Do not touch any parts of the circuitry on the digital programmer circuit since static electric discharge may damage this control panel.
Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot be removed.
7. A 240V AC is present at the shaded area  of the digital programmer circuit (Terminals of power relays and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

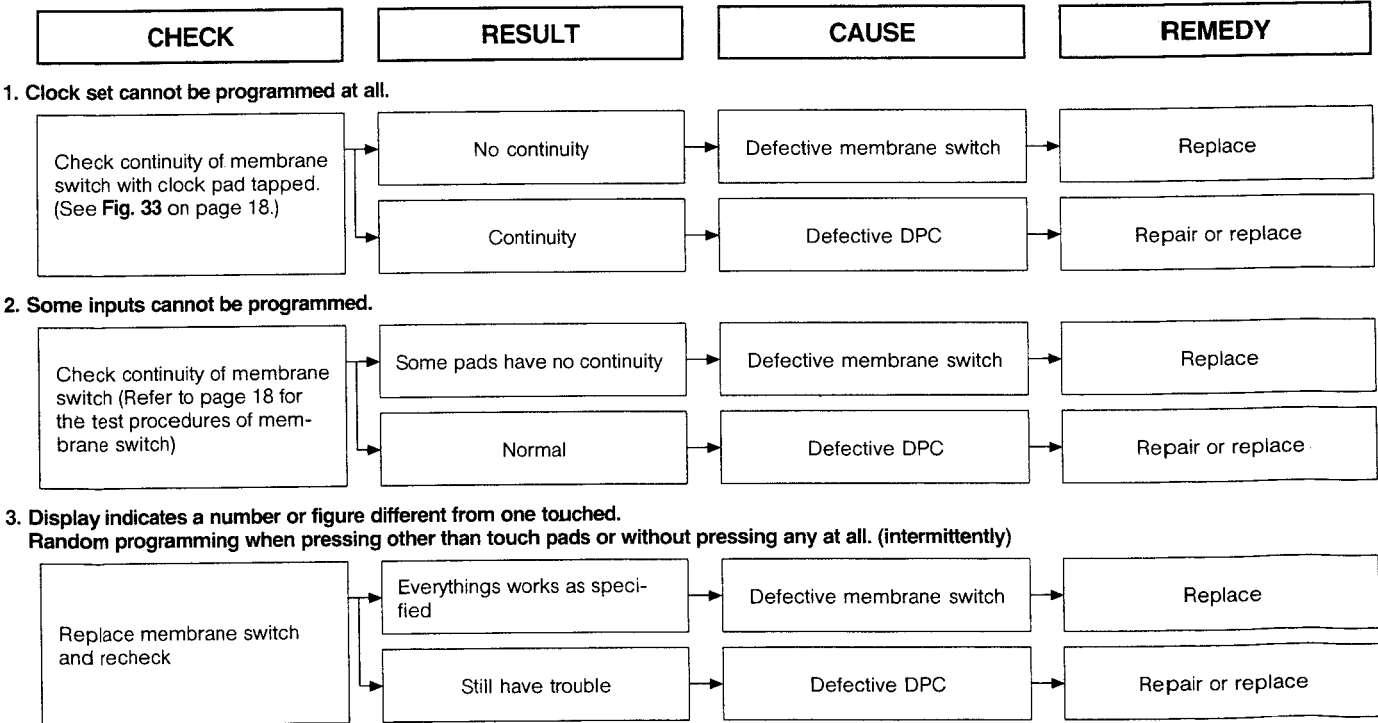
First of all operate the microwave oven following the correct operating procedures described on pages 29 ~ 31 in order to find the exact cause of any trouble.

[TROUBLE 1] The following visual conditions indicate a probable defective digital programmer circuit (D.P.C.) or membrane key board (membrane switch assembly).

A. In case of following conditions, D.P.C. is defective.

1. Incomplete segments.
 - (A) Segments missing.
 - (B) Partial segments missing.
 - (C) Digit flickering other than normal fluorescent slight flickering.
 - (D) Colon does not turn on or does not blink when the clock pad is tapped.
2. A distinct change in the brightness of one or more numbers in the display.
3. One or more digits in the display not on when they should be.
4. Wrong or no power indicator light for power level selected.
5. Specific numbers (for example 2 or 3) will not display.
6. Display does not count down with time cooking or when using display as a timer.
7. Display does not count up with clock operation.
8. Oven is programmable and cooks normally but no display shows.
9. Display obviously jumps in time while counting down or up.
10. Display counts down noticeably too fast while cooking.
11. Display cannot shift from the first stage cooking to the second stage cooking even though Two Stage Cooking is programmed.
12. Display does not stop counting down with time cooking even when Stop/Cancel Pad is tapped.
13. Time of day does not reappear when cooking is finished.

B. In case of following conditions, either D.P.C. or membrane switch is defective.



[TROUBLE 2] Oven does not operate at all; Display window does not display any figures and no key inputs of any pads will be accepted.

1. 10A fuse has been blown.

CHECK	RESULT	CAUSE	REMEDY
Check continuity of short switch with door closed	Continuity	Shorted contacts of short switch	Replace
Check continuity of safety switch A's contacts with door partially open until short switch contacts close	Continuity	Shorted contacts of safety switch A	Replace
Check the protector diode (NOTE 1)	Continuity in one or both directions	Shorted D2 or both D1/D2 in protector diode	Replace (NOTE 2)
Check the diode	Continuity in both directions	Shorted diode	Replace
Disconnect both 2 lead wires connected to filament terminals of magnetron and check the continuity between filament and magnetron case	Continuity	Shorted filament with anode of magnetron	Replace magnetron
Disconnect both 2 lead wires connected to filament terminals of magnetron and check the continuity between filament winding of H.V. Transformer and chassis	Continuity	Shorted filament winding of H.V. Transformer	Replace
		Vacuum failure in magnetron	Replace
Disconnect one side of lead wire connected from high voltage transformer to the high voltage capacitor and operate the unit.	Normal	Defective high voltage capacitor	Replace
	10A fuse again blows	Defective high voltage transformer	Replace

NOTE 1: Refer to component test procedure on page 19.

NOTE 2: If components such as diode or magnetron in high voltage circuit becomes shorted, protector diode becomes also shorted resulting in 10A fuse to be blown in order to protect h.v.transformer from overheating. In case that protector diode is shortcircuited, check the components in high voltage circuit and replace it together with protector diode if it is defective.

2. Outlet has proper voltage. Fuse is not open.

CHECK	RESULT	CAUSE	REMEDY
Check continuity of thermal cutouts (magnetron and oven)	No continuity	Defective thermal cutout	Replace
Check continuity between P1 and P2 terminal of low voltage transformer.	Infinity	Open winding of low voltage transformer	Replace
	Approx. 200~300 Ω (Normal)	Defective DPC	Repair or replace

[TROUBLE 3] Display shows all figures selected, but oven does not start cooking even though desired program and time are set and start pad is tapped.

1. Oven lamp turns on but turntable does not.

CHECK	RESULT	CAUSE	REMEDY
Check continuity of safety switch A with door closed.	No continuity	Malfunction of safety switch A	Adjust or replace

2. Oven lamp and turntable turn on.

CHECK	RESULT	CAUSE	REMEDY
Check if 240 V AC is applied to the primary side of high voltage transformer	Yes, 240 V is applied	Please proceed to troubleshooting number 3 of this TROUBLE on page 24.	
	No		
Check DC voltage being supplied to power relay 5 coil (RY5) (NOTE 3) See Fig.39 on page 26.	0 volts	Defective digital programmer circuit	Repair or replace
	Normal	Faulty contacts of power relay 5 or open relay coil	Replace

NOTE 3: Follow the test procedures below.

- (1) Unplug the oven from outlet.
- (2) Disconnect 2 lead wires connected to the high voltage transformer primary side, and isolate them.
- (3) Connect DC volt meter between terminals of power relay 5 coil (RY 5) on the D.P.C. (See Fig. 39 on page 26.)
- (4) Plug in the oven.
- (5) Set High power with desired cooking time and tap start pad.
Normal digital programmer circuit should read approx. 18V DC continuously.

CAUTION

A 240V AC is present at the shaded area  of the digital programmer circuit (Terminals of power relays and primary circuit of low voltage transformer).
When troubleshooting, be cautious of possible electrical shock hazard.

3. 240V AC is applied to primary side of high voltage transformer.

CHECK	RESULT	CAUSE	REMEDY
Disconnect one lead wire connected to filament terminal of magnetron and check the continuity of magnetron's filament	No continuity	Defective magnetron	Replace
Check the continuity of the high voltage transformer primary winding (0—240V)	No continuity	Open winding of the high voltage transformer	Replace
Check the continuity of filament winding of high voltage transformer	No continuity	Defective high voltage transformer	Replace
	Normal	Aging change of magnetron	Replace magnetron

[TROUBLE 4] Microwave output power is low. First of all, check if output is really low by following “Measurement of microwave output” on page 20.

CHECK	RESULT	CAUSE	REMEDY
Check the power source voltage with magnetron oscillating.	Lower than 220 volts	Decrease in power source voltage	Inform customer of required power voltage
	Normal		
Check the timing periods of the 18V DC being applied to the power relay 5 coil (Refer to page 7 for the timing periods of the power relay 5)	Abnormal	Defective digital programmer circuit	Repair or replace
	Normal	Aging change of magnetron	Replace depending on the result of output test

[TROUBLE 5] Oven lamp and turntable turn on when power supply cord is plugged into wall receptacle.

CHECK	RESULT	CAUSE	REMEDY
Check continuity of safety switch B with door closed	No continuity	Open safety switch B	Replace
	Continuity		
Check continuity of power relay 4 contacts (RY4)	Continuity	Shorted contacts of power relay 4 (RY4)	Replace
	Normal	Defective DPC	Repair or replace

**[TROUBLE 6] Microwave oven does not operate normally, when auto sensor cooking is selected.
(NN-8807/8857)**

CHECK	RESULT	CAUSE	REMEDY
1. Oven stops its operation about 70 seconds after start pad is tapped.			
Check wiring connected to sensor element terminals from digital programmer circuit	Open or loose		Repair
Check humidity sensor and D.P.C. (Refer to component test procedure on page 19.)		Defective humidity sensor element	Replace
		Defective D.P.C.	Repair or replace
2. Auto sensor cooking does not operate normally.			
Is the oven located in a hot or damp place	Yes	Temperature and humidity is too high	Change oven location
	No		
Check the humidity sensor (Refer to component test procedure on page 19.)	Abnormal	Defective humidity sensor	Replace
	Normal	Defective digital programmer circuit	Repair or replace

[TROUBLE 7] Magnetron oscillates for 1~5 minutes after start pad is tapped, then stops all functions of the oven.

REASON: During first 1~5 minutes, magnetron is oscillates but the fan motor does not rotate, this causing the magnetron to heat up and open the magnetron thermal cutout.

WARNING

A high voltage is generated in the secondary winding of the high voltage transformer and also high voltage circuit, even though fan motor does not rotate. Be very cautious for high voltage when troubleshooting.

CHECK	RESULT	CAUSE	REMEDY
Check if fan motor is rotating	Yes	Defective thermal cutout (Magnetron)	Replace
		Surrounding temperature is too high	Install the oven onto proper location
	No	Defective fan motor	Replace
Check DC voltage being applied to power relay 1 coil (RY1) (NOTE 4)	Approx. 18V DC	Faulty contacts of power relay 1 or open relay coil (RY1)	Replace power relay 1 (RY1) (on the D.P.C.)
	0V	Defective DPC	Repair or replace

- NOTE 4: Follow the test procedures below.
- (1) Unplug the oven power cord.
 - (2) Disconnect 2 lead wires connected to the high voltage transformer primary side, and isolate them.
 - (3) Connect DC volt meter between power relay 1 coil (RY1) on the DPC. (Fig. 39)
 - (4) Open the door assembly.
 - (5) Plug in the oven power cord.
 - (6) Check DC voltage being applied to the power relay 1 coil with door opened.

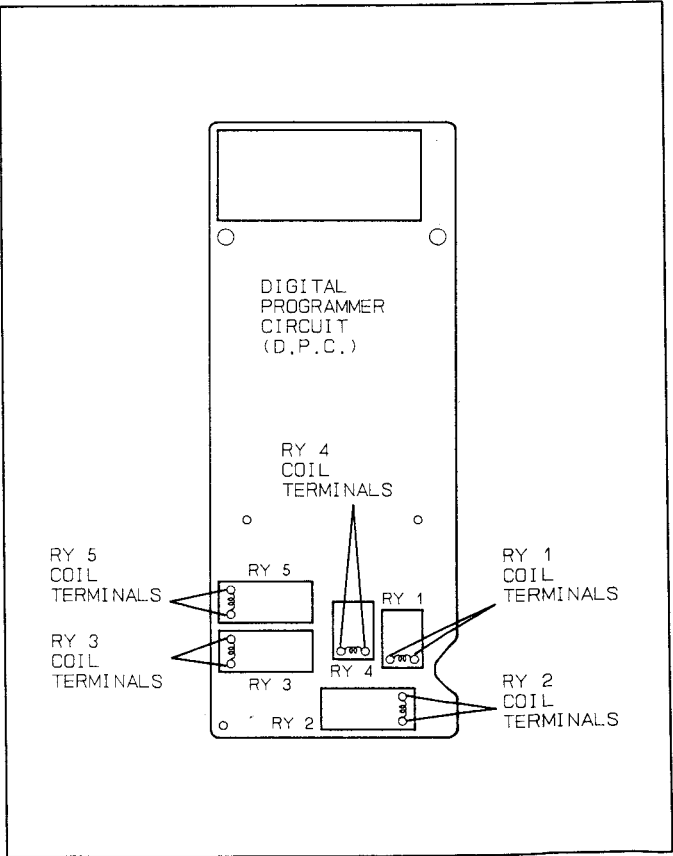


Fig. 39

[TROUBLE 8] Microwave cooking program works normally, but bake and/or grill cooking programs do not.

1. Upper heater does not heat at all.

CHECK	RESULT	CAUSE	REMEDY
Disconnect 2 lead wires from upper heater terminals and check continuity of the heater	No continuity	Open upper heater	Replace
	Approx. 30Ω (Normal)		
Check DC voltage being applied to power relay 2 coil (RY 2)	Approx. 18V DC (NOTE 5)	Faulty contacts of power relay 2 or open relay coil	Replace
	0V	Defective D.P.C.	Repair or replace

2. Lower heater does not heat at all.

CHECK	RESULT	CAUSE	REMEDY
Disconnect 2 lead wires from lower heater terminals and check continuity of the heater	No continuity	Open lower heater	Replace
	Approx. 40Ω (Normal)		
Check DC voltage being applied to power relay 3 coil (RY 3)	Approx. 18V DC (NOTE 5)	Faulty contacts of power relay 3 or open relay coil	Replace
	0V	Defective D.P.C.	Repair or replace

NOTE 5: Follow the test procedures below.

- (1) Unplug the oven from outlet.
- (2) Disconnect 2 lead wires connected to the high voltage transformer primary side, and isolate them.
- (3) Connect DC volt meter between following relay terminals:
 - ※ Power relay 2 coil terminals (RY 2) for upper heater
 - ※ Power relay 3 coil terminals (RY 3) for lower heater
- (4) Plug in the oven.
- (5) Set bake programme at 150°C with desired cooking time, and tap start pad.
- (6) Check DC voltage being applied to the power relay 2 coil or power relay 3 coil. An 18V DC signal comes out of the normal digital programmer circuit and is applied to the coil of power relay 2 and 3 alternately as shown in Fig. 7 and 8 on page 8.

[TROUBLE 9] Upper or lower heater turns on when microwave cooking.
In this case, this trouble should be causing fuse and/or home circuit breaker to open.

CHECK	RESULT	CAUSE	REMEDY
Check continuity of power relay 2 and 3 (Check between terminals 3 and 4)	Continuity	Faulty power relay 2 or 3	Replace
	No continuity	Defective DPC	Repair or replace

[TROUBLE 10] Combination cooking is not working in correct order

CHECK	RESULT	CAUSE	REMEDY
Check timing period of DC voltage being applied to power relay 2, 3 and 5 (Refer to the description of combination cooking on page 10)	Abnormal	Defective DPC	Replace

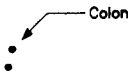
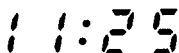
[TROUBLE 11] "FF FF" appears in display window after 2 minutes elapsed in the bake, grill or combination cooking mode.

CHECK	RESULT	CAUSE	REMEDY
Check continuity of oven temp sensor with CN3 connector unplugged. (NOTE 6)	0Ω or infinity	Short or open oven temp sensor	Replace
	Normal	Defective DPC	Repair or replace

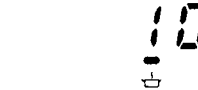
NOTE 6: Refer to component test procedure on page 19.

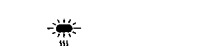
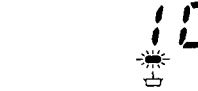
DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

1. Clock Setting

OPERATION	DISPLAY
1. Plug the power supply cable into wall receptacle.	
2. Tap Clock Pad.	
3. Enter time of day (TOD) by tapping appropriate number pads. Example: To Set 11:25 • Tap 10 min pad once • Tap 1 min pad once • Tap 10 sec pad twice • Tap 1 sec pad 5 times	
4. Tap Clock Pad.	

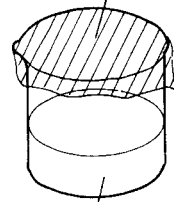
2. Time Cooking/Three Stage Cooking

OPERATION	DISPLAY
1. Place a water load in the oven.	
2. Tap Power Pad. (Example: Tap power select pad once for high power setting.)	
3. Tap Stop/Cancel Pad.	
4. Select "HIGH" () power and set for 5 seconds by tapping the appropriate pads. (1st stage)	
5. Set MEDIUM () power for 4 seconds. (2nd stage)	
6. Set SIMMER () power for 10 seconds. (3rd stage)	

OPERATION	DISPLAY
7. Tap Start Pad. (1st stage)	
8. (2nd stage)	
9. (3rd stage)	
10. When third stage cooking ends, oven beeps five times and shuts off automatically.	• TOD appears in display window.

3. Auto Sensor Cooking (NN-8807/8857) ()

NOTE: Make sure that the outer panel is installed before Auto Sensor Cooking Test, since Auto Sensor function does not operate properly without the outer panel.

OPERATION	DISPLAY
1. Pour $150 \pm 15\text{cc}$ ($4.5 \pm 1/2$ ozs) of room temperature water in a beaker, securely cover the top of the beaker with plastic wrap and place the beaker in the center of the oven.	COVER THE TOP OF THE BEAKER WITH PLASTIC WRAP  $150 \pm 15\text{cc}$ ($4.5 \pm 1/2$ ozs) ROOM TEMPERATURE WATER
2. Tap Auto Sensor "Fresh Foods" Pad () 5 times.	
3. Tap Start Pad.	

OPERATION	DISPLAY
4. The humidity sensor detects steam about 2 to 5 minutes after the Start Pad is tapped. Auto Sensor Cooking (T1) automatically switches to time cooking (T2). "A5" disappears with beep sounds and the remainder of cooking time appears in display window. NOTE: Cooking time will vary depending on the water temperature, the shape of beaker or the power source voltage. NOTE: K factor for A5 program is 0.9. Please refer to page 12 in detail.	 54  3 36 NOTE: If 54 to 3 36 (54 seconds to 3 minutes 36 seconds) appears, AUTO SENSOR FUNCTION is normal.
5. When the balance of cooking time has elapsed, oven stops and beeps five times.	• TOD reappears in the display window.

4. Auto Weight Combination Cooking ()

OPERATION	DISPLAY
1. Pour adequate water in a oven glass-ware or ceramic utensil and place the utensil on the white glass ceramic tray in the oven. Tap Auto Weight Combination Pad () 5 times to select Category 5.	 lb oz
2. Select the correct indicator between kg and lb. oz by tapping kg/lb convert pad.	 kg
3. Set the weight to 3 kg by tapping 1 kg pad three times.	 3.0 kg
4. Tap Start Pad. • Combination Cooking time "2h 00" appears and starts counting down.	 2h 00
5. Tap Stop/Cancel Pad twice.	• TOD appears in display window.

5. Combination Cooking (Time cooking) ()

OPERATION	DISPLAY
1. Pour adequate water in a oven glass-ware or ceramic utensil and place the utensil on the white glass ceramic tray in the oven. Tap combination pad () twice.	 2
2. Set cooking time for 2 min.	 h 2
3. Tap Start pad.	 2 00

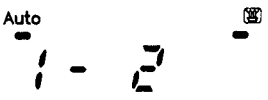
6. Bake Cooking without Preheat ()

OPERATION	DISPLAY
1. Remove the glass ceramic tray from oven cavity when bake cooking. Tap Bake Pad () twice.	 11 00
2. Set bake cooking time for 2 min.	 h 2
3. Tap Start pad.	 2 00

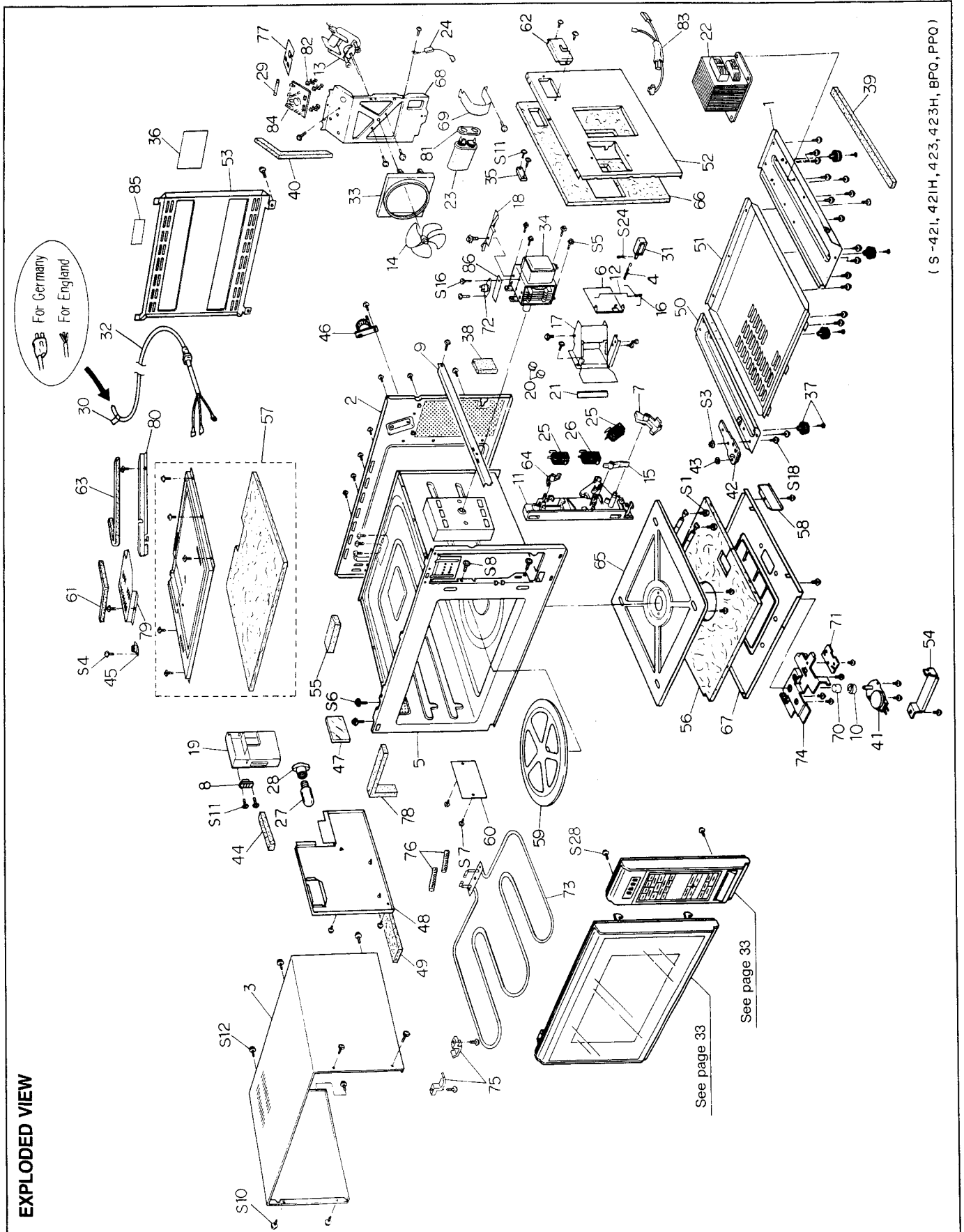
7. Bake Cooking with Preheat ()

OPERATION	DISPLAY
1. Remove the glass ceramic tray from oven cavity when bake cooking. Tap Bake Pad () twice.	
2. Tap start pad.	
3. When preheating is completed, oven beeps three times. "P" begins to blink.	
4. After completion of preheating, be sure to open the door.	
5. Close the door and set bake cooking time for 2 min.	
6. Tap start pad.	

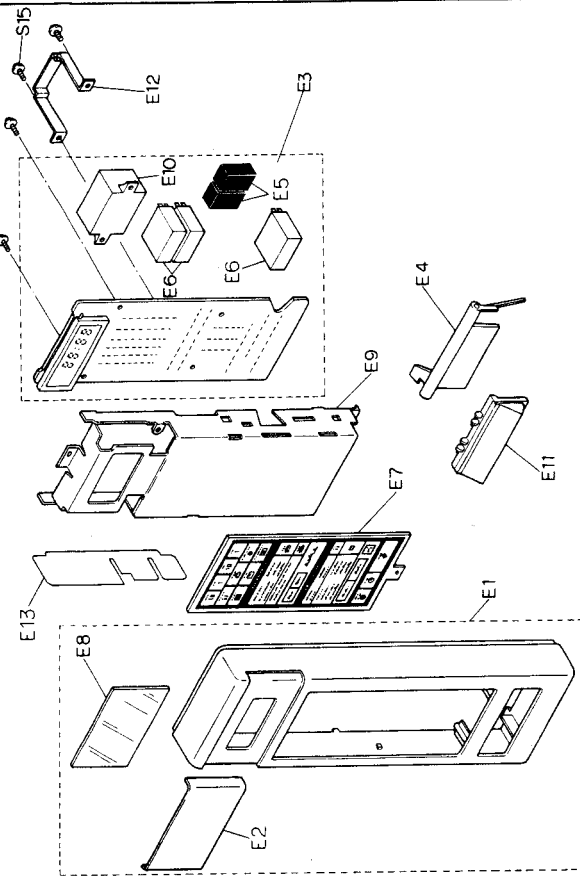
8. Auto Reheat Combination Cooking ()

OPERATION	DISPLAY
1. Pour adequate water in a oven glass-ware or ceramic utensil and place the utensil on the white glass ceramic tray in the oven. Tap Auto Reheat Combination 1: Pizza Pad () twice.	
2. Tap Start Pad. • Auto Reheat Combination time "10:00" appears and starts counting down.	
3. Tap Stop/Cancel Pad twice.	• TOD appears in display window.

EXPLODED VIEW AND PARTS LIST

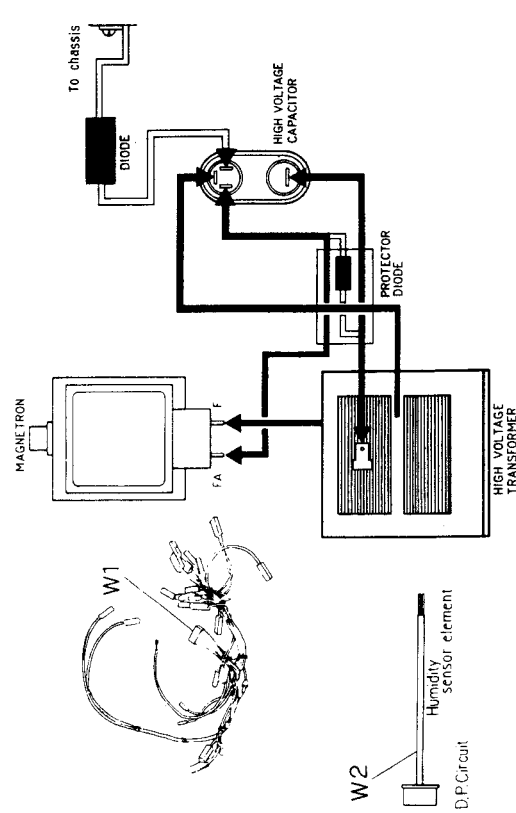


ESCUTCHEON BASE ASSEMBLY



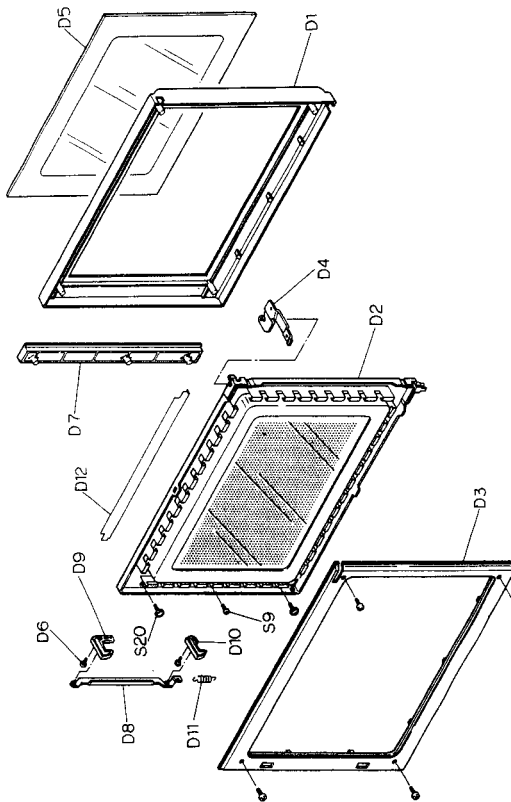
(S-421, 421H, 423, 423H, BPQ, PPQ)

WIRING MATERIAL



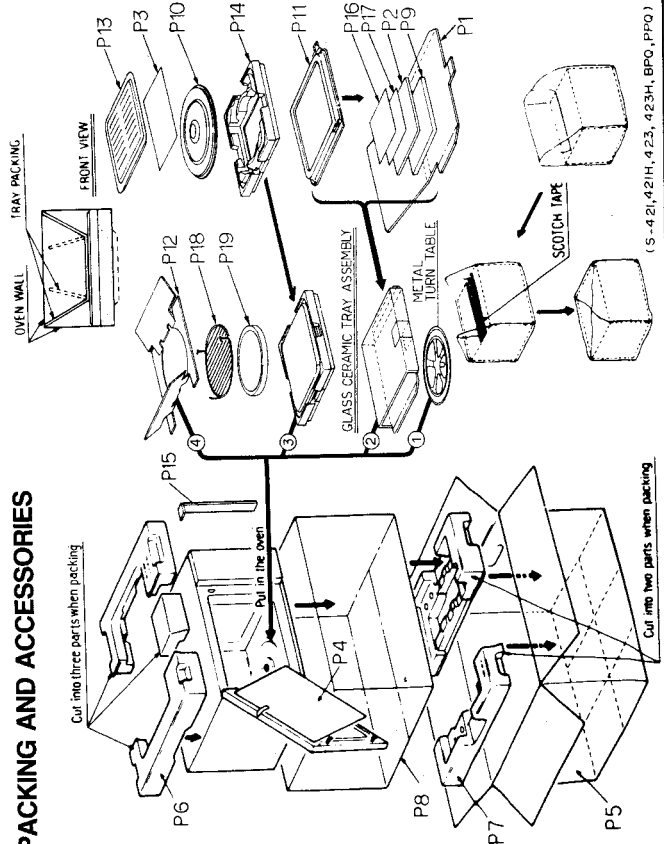
(S-421, 421H, 423, 423H, BPQ, PPQ)

DOOR ASSEMBLY



(S-421, 421H, 423, 423H, BPQ, PPQ)

PACKING AND ACCESSORIES



(S-421, 421H, 423, 423H, BPQ, PPQ)

PARTS LIST

NOTE 1: When ordering replacement part(s), please use part number(s) shown in this parts list.
Do not use description of the part.

2: Important safety notice:

Components identified by $\triangle$ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
1	A10014210BP	Base	1		53	A10584210AP	Back panel cover A	1	
2	A10044210AP	Back panel	1		54	A66304210AP	Motor stopper	1	
3	A10094210BP	Outer panel assy	1	NN-8507, NN-8807	55	ANE0924000AD	Cushion rubber C	1	
	A10094210HBP	Outer panel assy	1	NN-8557, NN-8857					
4	A41754210AP	Spring	1		56	A22424210BP	Adiabatic material A	1	
5	A200A4210BP	Oven	1	(NOTE 3)	57	A202N4210BP	Outer heater panel	1	
6	A41734210AP	Shutter	1		58	A42094210AP	Air guide G	1	
7	ANE31372Q0AP	Hook spacer B	1		59	A201F4210AP	Metal turn table	1	
8	$\triangle$ ANE601L-F70	Humidity sensor	1	NN-8807, NN-8857	60	A20554210AP	Cover A	1	
9	A20364210AP	Reinforce bracket B	1		61	ANE0963000AN	Cushion rubber D	1	
10	A401X4210BP	Bearing spacer	1		62	A22184210AP	Heater panel B	1	
					63	ANE0963000AR	Cushion rubber D	1	
11	ANE30207J0AP	Door hook A	1		64	ANE31362Q0AP	Hook spacer A	1	
12	A41744210AP	Shaft	1		65	$\triangle$ A630G4210BP	Heater A	1	
13	$\triangle$ A400A4210BP	Fan motor	1	(21W)	66	A22594210AP	Adiabatic material D	1	
14	ANE40086W0AP	Fan	1		67	A22774210AP	Lower heater panel	1	
15	ANE31382Q0AP	Hook spacer C	1		68	A41124210AP	Fan motor bracket B	1	
16	A41764210AP	Spring B	1		69	ANE6037X00AP	Capacitor bracket	1	
17	A400E4210AP	Air guide A	1		70	A40714210BP	Motor rubber	1	
18	A40474210AP	Air guide E	1		71	A60324210AP	Terminal plate A	1	
19	A400K4210BP	Exhaust guide	1	NN-8507, NN-8557	72	$\triangle$ A61454210AP	Thermal cutout	1	For magnetron
	A400K4230BP	Exhaust guide	1	NN-8807, NN-8857	73	$\triangle$ A630H4210BP	Heater B	1	
20	A41834210AP	Cushion rubber A	2		74	A63234210AP	Motor bracket	1	
21	A41844210AP	Cushion rubber B	1		75	ANE6418Z70BP	Heater support B	2	
22	$\triangle$ A600B4080BP	H.V. Transformer	1	(1.5KVA)	76	A61394210BP	Insulation tube	2	
23	$\triangle$ A60904080GP	H.V. Capacitor	1	(1.14 μ F, AC2100V)	77	A60714210AQ	Insulation sheet B	1	
24	A62024000AP	Diode	1	(Si)	78	A41034210AQ	Air guide cushion B	1	
25	$\triangle$ ANE61422Q0BP	Switch	2	Safety switch A, B (AV53406)	79	A400P4210BP	Exhaust guide B	1	
					80	A41454210BP	Exhaust guide G	1	
26	$\triangle$ ANE61782Q0BP	Switch	1	Short switch (AV52406)	81	ANE6239Z70BP	Insulation cap	1	
27	A60304080BP	Oven lamp	1	(240V, 20W)	82	ANE6532-F70	Spacer A	3	
28	$\triangle$ A61524210AP	Oven lamp socket	1		83	$\triangle$ A606V4210BP	Protector diode	1	
29	$\triangle$ A62304210BP	Fuse	1	(10A)	84	A692Y4210BP	Noise filter	1	
30	ANE0239570BN	Cord label	1		85	A01574210BP	Name plate B	1	NN-8507
						A01574210HBP	Name plate B	1	NN-8557
31	A60174210AP	Solenoid	1			A01574230BP	Name plate B	1	NN-8807
32	$\triangle$ A90244210BP	Power supply cord	1	For England		A01574230HBP	Name plate B	1	NN-8857
	$\triangle$ A900C4210GP	Power supply cord	1	For Germany					
33	A41444210AP	Orifice	1		86	A62384310AG	Spacer	1	
34	$\triangle$ 2M210-M1	Magnetron	1						
35	A605Y4210BP	Oven temp sensor	1						
36	A00064080BP	Warning label	1						
37	A10084210AP	Rubber foot	4						
38	ANE0901000CD	Cushion rubber A	1						
39	ANE000Z000AD	Cushion rubber C	1						
40	ANE000Z000AA	Cushion rubber A	1						
41	$\triangle$ A63264210BP	Turntable motor	1	(3W)					
42	A301L4210AP	Lower hinge	1						
43	ANE3081B60AP	Door hinge spacer	1						
44	ANE0913000BF	Cushion rubber B	1						
45	$\triangle$ A61454000AP	Thermal cutout	1	For oven					
46	ANE11408A0AG	Stopper A	1						
47	A64374210AP	Glass plate	1	For oven lamp					
48	A22374210AP	Left heater panel	1						
49	ANE0926000BT	Cushion rubber C	1						
50	A11294210AP	Base B	1						
51	A101A4210AP	Base C	1						
52	A22364210AP	Right heater panel	1						

NOTE 3: Please order name plate together.

DOOR ASSEMBLY

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
D1	A30014210BP	Door A assy	1	NN-8507, NN-8807
	A30014210HBP	Door A assy	1	NN-8557, NN-8857
D2	A302K4210AP	Door E assy	1	
D3	A30854210AP	Door C	1	NN-8507, NN-8807
	A30854230HAP	Door C	1	NN-8557, NN-8857
D4	A300B4210AP	Upper hinge	1	
D5	A31464210BP	Door screen B assy	1	NN-8507, NN-8807
	A31464210HBP	Door screen B assy	1	NN-8557, NN-8857
D6	ANE30562Q0AP	Handle pin	2	
D7	A30124210BP	Door handle	1	NN-8507, NN-8807
	A30124210HBP	Door handle	1	NN-8557, NN-8857
D8	A301H4210AP	Door key lever B	1	
D9	ANE30182Q0AP	Door key A	1	
D10	ANE30192Q0AP	Door key B	1	
D11	A30214210BP	Door key spring	1	
D12	A31524210HBP	Door metal	1	NN-8557, NN-8857

PACKING AND ACCESSORIES

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
P1	A01174210AP	Packing B	1	
P2	A00034210BP	Instruction book	1	
P3	ANE0207-860	Styrol sheet	1	
P4	A01074060AP	Door sheet	1	
P5	A01024210BP	Outer case	1	NN-8507 England
	A01024210EP	Outer case	1	NN-8507 Germany
	A01024210HBP	Outer case	1	NN-8557 England
	A01024210HEP	Outer case	1	NN-8557 Germany
	A01024230BP	Outer case	1	NN-8807 England
	A01024230EP	Outer case	1	NN-8807 Germany
	A01024230HBP	Outer case	1	NN-8857 England
	A01024230HEP	Outer case	1	NN-8857 Germany
P6	A01044210AP	Upper filler	1	
P7	A01054210AP	Lower filler	1	
P8	A01064000AP	Vinyl cover	1	
P9	A000B4210BP	Cook book	1	
P10	ANE0601-Y30	Glass ceramic tray	1	
P11	A060W4210AP	Slide-in shelf	1	
P12	A01084210BP	Tray packing	1	
P13	A06484210AP	Splash guard	1	
P14	A01134210AP	Tray styrol	1	
P15	ANE0145110AG	Door sheet B	1	
P16	ANE0013X70BP	Warranty card	1	For England
P17	ANE0169Q50GN	Servicenter list	1	
P18	ANE0602Z70BP	Wire rack	1	
P19	A06034210BP	Roasting dish	1	

ESCUTCHEON BASE ASSEMBLY

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
E1	A800L4210BP	Escutcheon base assy	1	NN-8507
	A800L4210HBP	Escutcheon base assy	1	NN-8557
	A800L4230BP	Escutcheon base assy	1	NN-8807
	A800L4230HBP	Escutcheon base assy	1	NN-8857
E2	A80014210BP	Escutcheon A	1	NN-8507
	A80014210HBP	Escutcheon A	1	NN-8557
	A80014230BP	Escutcheon A	1	NN-8807
	A80014230HBP	Escutcheon A	1	NN-8857
E3	△ A603L4210BP	D.P.Circuit assy	1	NN-8507, NN-8557 (W/Component)
	△ A603L4230BP	D.P.Circuit assy	1	NN-8807, NN-8857 (W/Component)
E4	A82564210AP	Door opening lever	1	
E5	△ AEAJZDC18	Power relay	2	(JZ1aF-18V) (RY1, 4)
E6	△ AEG5WA1ER18A	Power relay	3	(G5W-A) (RY2, 3, 5)
E7	△ A64794210BP	Membrane switch	1	NN-8507
	△ A64794210HBP	Membrane switch	1	NN-8557
	△ A64794230BP	Membrane switch	1	NN-8807
	△ A64794230HBP	Membrane switch	1	NN-8857
E8	A81264080HBP	Smoke panel	1	
E9	A81274210AP	Bracket	1	
E10	△ A62494230BP	L.V.Transformer	1	(ETP48K102E)
E11	A80724210BP	Door opening button	1	NN-8507, NN-8807
	A80724230HAP	Door opening button	1	NN-8557, NN-8857
E12	ANE6551R20AP	L.V.T.Support bracket	1	
E13	A62864230BP	Shield plate	1	

WIRING MATERIAL

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
W1	A030A4210BP	Lead wire harness	1	
W2	A03534230BP	Lead wire	1	NN-8807, NN-8857

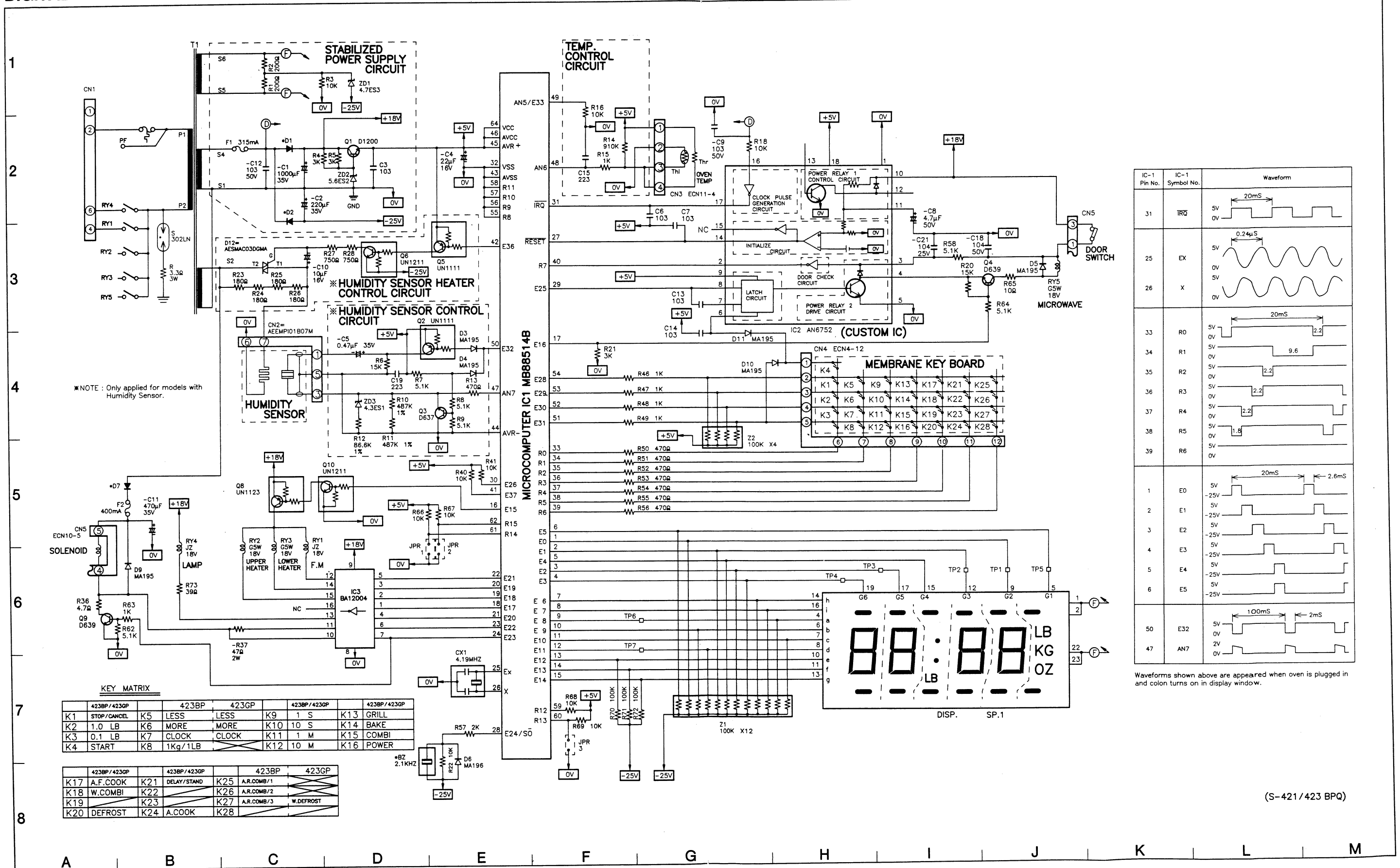
STANDARD PARTS

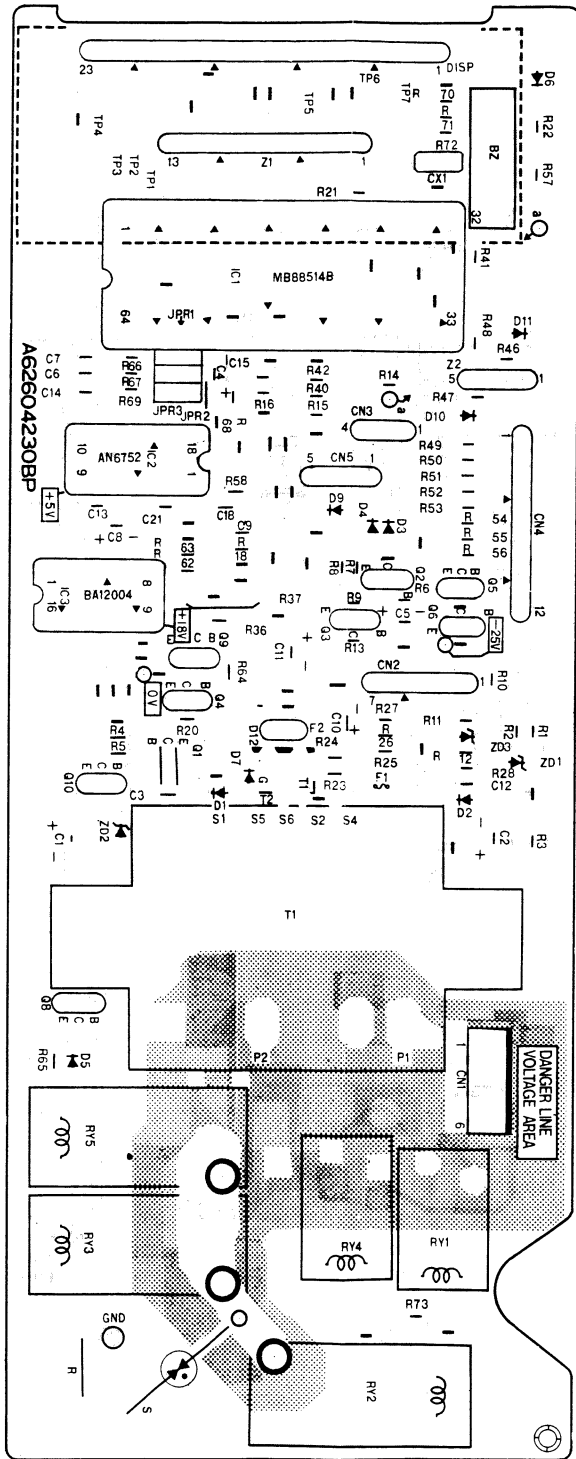
Ref. No.	Part No.	Description	Size (mm)	Q'ty	Usage
S1	XYN5+C10FN	Screw	5×10	2	Heater A
S2	XTW4+12Q	Screw	4×12	4	Bracket
S3	XNwane5ES	Nut	M5	2	Lower hinge
S4	XTW3+6S	Screw	3×6	1	Thermal cutout (For Oven)
S5	XTWANE4+10RU	Screw	4×10	4	Magnetron
S6	XYEANE5+E12S	Screw	5×12	2	Upper hinge
S7	XST4+5US	Screw	4×5	2	Cover A
S8	XTW4+12T	Screw	4×12	2	Door hook A
S9	XTNANE4+10B	Screw	4×10	1	Door handle
S10	XTC4+12BFC	Screw	4×12	2	Turntable motor
S11	XTWANE3+8BN	Screw	3×8	4	Outer panel
				2	Oven temp sensor
				2	Humidity sensor (NN-8807, NN-8857)
				2	Heater panel B
S12	XYCANE4+E12A	Screw	4×12	1	Exhaust guide F
				4	Base
				4	Outer panel
				4	H.V.Transformer
				3	Fan motor bracket B
				3	Base B
				3	Base C
S13	XTWANE4+8S	Screw	4×8	2	Fan motor
S14	XTW3+8B	Screw	3×8	1	Diode earth
S15	XTWANE4+12B	Screw	4×12	1	Capacitor bracket
				2	L.V.T.Support bracket
S16	XTEANE3+6B	Screw	3×6	2	Thermal cutout (For magnetron)
S17	XYN3+F5S	Screw	3×5	2	Solenoid
S18	XYEANE5+E20T	Screw	5×20	2	Lower hinge
S19	XTY4+E10FN	Screw	4×10	3	Heater B
S20	XTW4+8T	Screw	4×8	2	Door handle
S21	XYF4ZAF6	Screw	4×6	1	Air guide A
				1	Air guide F
S22	XTWANE4+12BN	Screw	4×12	4	Outer heater panel
				1	Right heater panel
				2	Left heater panel
				2	Heater A
				1	Exhaust guide
				3	Motor bracket
				3	Exhaust guide B
				1	Air guide G
S23	XTBANE4+12FK	Screw	4×12	4	Door C (NN-8507, NN-8807)
	XTBANE4+12FC	Screw	4×12	4	Door C (NN-8557, NN-8857)
S24	XPD25X15CU	Wire pin	2.5×15	1	Solenoid
S25	XTWANE4+12D	Screw	4×12	1	Reinforce bracket
				1	Stopper A
S26	XYC4+F16XN	Screw	4×16	2	Heater support
S27	XTWANE4+8BN	Screw	4×8	1	Fan bracket A
				2	Heater holder A
				1	Terminal plate A
				1	Motor stopper
				1	Exhaust guide G
S28	XYDANE4+HE10	Screw	4×10	2	Escutcheon base
				1	Power supply cord earth
				1	Noise filter earth
S29	XYCANE4+E12N	Screw	4×12	4	Back panel
				2	Back panel cover A
S30	XTW3+6B	Screw	3×6	1	Membrane switch
S31	XYT4+C8VS	Screw	4×8	2	Heater B

Ref.No.84 Noise filter

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
C1	ECQU2A104MN	Capacitor 0.1μF	1	(±20%, 250V)
C2, 3	ECKDNS472MEX	Capacitor 0.0047μF	2	(±20%, 250V)
ZNR	ERZC10DK621F	Varistor	1	
L1, 2	ANE621A7B0JN	Filter coil	1	
	ANE6231Q50GN	Fuse holder	2	

DIGITAL PROGRAMMER CIRCUIT PARTS LIST (NN-8507/8557/8807/8857 BPQ, PPQ)





MISCELLANEOUS

Ref. No.	Part No.	Description	Pcs/Set	Remarks
DISP	A64564100BP	Fluorescent Tube	1	
SPACER	A82844210BP	Spacer Cushion	1	For DISP
T1	A62494230BP	Low Voltage Transformer	1	ETP48K102E
CN1	AEEMPI01C06M	6 pin connector	1	
CN2	AEEMPI01B07M	7 pin connector	(1)	
CN3	AEEMMA00F04V	4 pin connector	1	
CN4	AEEMWD1012	12 pin connector	1	
CN5	AEEMPI01C05M	5 pin connector	1	
BZ	AEFB22EP2002	Buzzer	1	2.04kHz
CX1	AEFFCST4R19G	Ceramic Resonator	1	4.19MHz
RY1,4	AEAWJZDC18	Power Relay	2	
RY2,3,5	AEQ5WA1ER18A	Power Relay	3	
F1	ANE604K7J0BP	Weak Point Element	1	315mA
F2	UN10006	Fuse	1	600mA
S	ANE6489Z70BP	Surge Absorber	1	
GND	ANE03592Q0BP	Lead Wire	1	

CAPACITORS

Ref. No.	Part No.	Description	Pcs/Set	Remarks
C1	ECEA1VU102E	1000µF ±20% 35V	1	
C2	ECEA1VU221E	220µF ±20% 35V	1	
C3,6,7,13,14	ECBT1E103ZF5	0.01µF -20%+80% 25V	5	
C4	ECEA1CU220E	22µF ±20% 16V	1	
C5	ECSF1VE474E	0.47µF ±20% 35V	(1)	
C8	ECEA1HU4R7E	4.7µF ±20% 50V	1	
C9,12	ECKR1H103ZF	0.01µF -20%+80% 50V	2	
C10	ECEA1CU100E	10µF ±20% 16V	(1)	
C11	ECEA1VU471E	470µF ±20% 35V	1	
C15,19	ECBT1E223ZF5	0.022µF -20%+80% 25V	2	
C18,21	AECF50F104Z	0.1µF -20%+80% 50V	2	

SEMICONDUCTORS

Ref. No.	Part No.	Description	Pcs/Set	Remarks
IC1	AEIC88514539	L.S.I. (MOS 4bit Microcomputer)	1	
IC2	AN6752	I.C. (Bipolar Linear IC)	1	
IC3	AEICBA12004	I.C. (Bipolar Linear IC)	1	
Q1	2SD1200-P,Q	Transistor, Si 5W	1	
Q2,5	UN4111	Transistor, Si 300mW	(2)	
Q3	2SC1685-R	Transistor, Si 250mW	(1)	
Q4,9	2SC1318-R	Transistor, Si 400mW	2	
Q6,10	UN4211	Transistor, Si 300mW	(2)	
Q8	UN4123	Transistor, Si 300mW	1	
D1,2,7	AEDNERA1502	Diode, Si	3	
D3,4,5,9,10,11	MA195-(TA5)	Diode, Si	(6)	
D6	MA196-(TA5)	Diode, Si	1	
D12	AESMAC03DGMB	Triac	(1)	
ZD1	AEDZ4R7ES3T1	Zener Diode, Si	1	RD4.7ES3
ZD2	AEDZ5R6ES2T1	Zener Diode, Si	1	RD5.6ES2
ZD3	AEDZ4R3ES1T1	Zener Diode, Si	(1)	RD4.3ES1

RESISTORS

Ref. No.	Part No.	Description	Pcs/Set	Remarks
R1,2	ERDS2TJ201T	200Ω ±5% 1/4W	2	
R3,16,18,22,40,41,66,67,68,69	ERDS2TJ103T	10kΩ ±5% 1/4W	10	
R4,5,21	ERDS2TJ302T	3.0kΩ ±5% 1/4W	3	
R6,20	ERDS2TJ153T	15kΩ ±5% 1/4W	(2)	
R7,8,9,58,62,64	ERDS2TJ512T	5.1kΩ ±5% 1/4W	6	
R10,11	EROS2TKF4873	487kΩ ±1% 1/4W	(2)	
R12	EROS2TKF8662	86.6kΩ ±1% 1/4W	(1)	
R13,50,51,52,53,54,55,56	ERDS2TJ471T	470Ω ±5% 1/4W	8	
R14	ERDS2TJ914T	910kΩ ±5% 1/4W	1	
R15,46,47,48,49,63	ERDS2TJ102T	1.0kΩ ±5% 1/4W	6	
R23,24,25,26	ERDS2TJ181T	180Ω ±5% 1/4W	(4)	
R27,28	ERDS2TJ751T	750Ω ±5% 1/4W	(2)	
R36	ERDS2TJ4R7T	4.7Ω ±5% 1/4W	1	
R37	ERG2SJ470P	47Ω ±5% 2W	1	
R57	ERDS2TJ202T	2.0kΩ ±5% 1/4W	1	
R65	ERDS2TJ100T	10Ω ±5% 1/4W	1	
R70,71,72	ERDS2TJ104T	100kΩ ±5% 1/4W	3	
R73	ERDS2TJ151T	150Ω ±5% 1/4W	1	
Z1	AEXB12104J	100kΩ×12 ±5% 1/8W	1	
Z2	AEXB04104J	100kΩ×4 ±5% 1/8W	1	
R	AERBKNY3W3R3	3.3Ω ±5% 3W	1	